



# BA04MSB010

## Next Generation Chem Bio Battle Management System

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26 October 2005



# Outline

- Overview of CBRN Battle Management
  - Battle Management Decision Loop
  - CBRN Data Model
  - NGCBBM Decision Loop
- Examples of CBRN Information Management
  - Sensor / Actuator interaction
  - Analysis and assessment
  - Status
  - Response plans
- Examples of Operational Environment System Configuration
  - Data Acquisition
  - Operation Across Guards
  - Multi-level Data Processing
- Conclusions



# CBRN Battle Management

- Create an sufficiently accurate and understandable representation of the real world to provide actionable information which the warfighter can use to effectively influence the real world in real time.
- Build a tool the warfighter recognizes
  - Improve acceptance
  - Make use of centuries of evolution
  - Play CONOPS/technology leapfrog

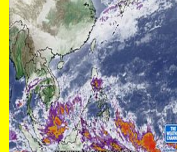


# Battle Space

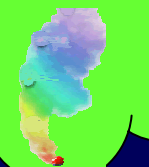
**Force Protection**



**Met Data**



**Hazard  
Models**



**NBC Recon**



**Battlefield  
Situational  
Awareness**

**Attack  
Events**



**Sensor Data**



**Operational Status**

LG, SF, TRANS,  
OPS, FD, EOD, ETC...





# CBRN

## Battle Management Questions

- What is it?
- Where is it?
- What is the impact on missions?
- How long will impact last?
- What will change the extent, degree or length of impact?
- What confirms/contradicts a change in impact?



# Battle Management Spectrum

## Fixed Site (RestOps)

**Fixed Participants**

**Fixed Infrastructure**

**Well Defined Mission**

**Train Together**

**Years to prepare**

**Single Platform**

## Expeditionary Site (CASPOD)

**Know Participants**

**Portable Infrastructure**

**Defined Mission**

**Coordinated CONOPS**

**Weeks to Prepare**

**Multiple Platforms**

## Mobile Site

**Know Participants**

**Mobile Infrastructure**

**Defined Mission**

**Coordinated CONOPS**

**Hours to Prepare**

**Multiple Platforms**

## Incident Response (IMCR)

**Unknown Participants**

**Any Infrastructure**

**Save Lives**

**Limited or No CONOPS**

**Hours to Prepare**

**Any Platform**



# Chem/Bio Battle Management



Portal Shield  
Detector Network



One-Way  
Link



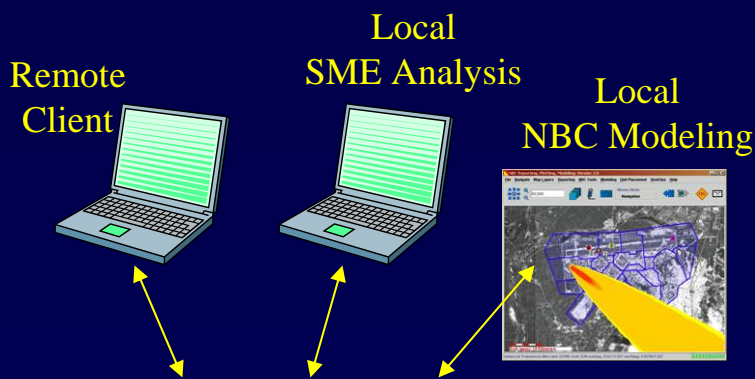
One-Way  
Link

Remote Data Relay  
Detector Network



Remote Data Relay  
Warning Network

One-Way  
Link



Remote  
NBC Modeling  
(JEM)



One-Way  
Link

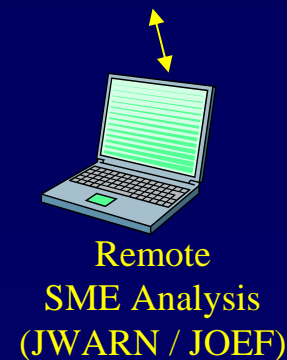
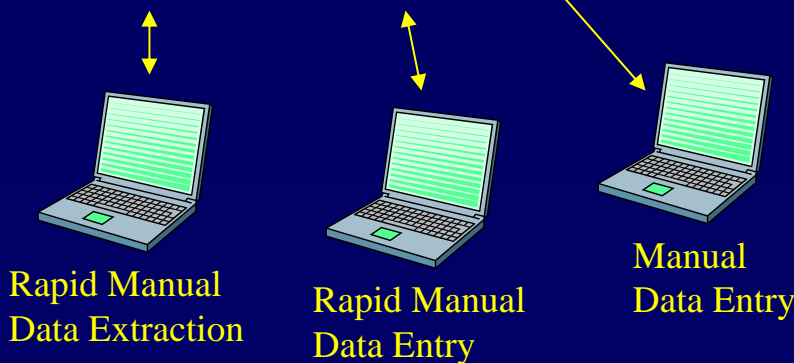


Survival Recovery Center

Potential  
Comm Link

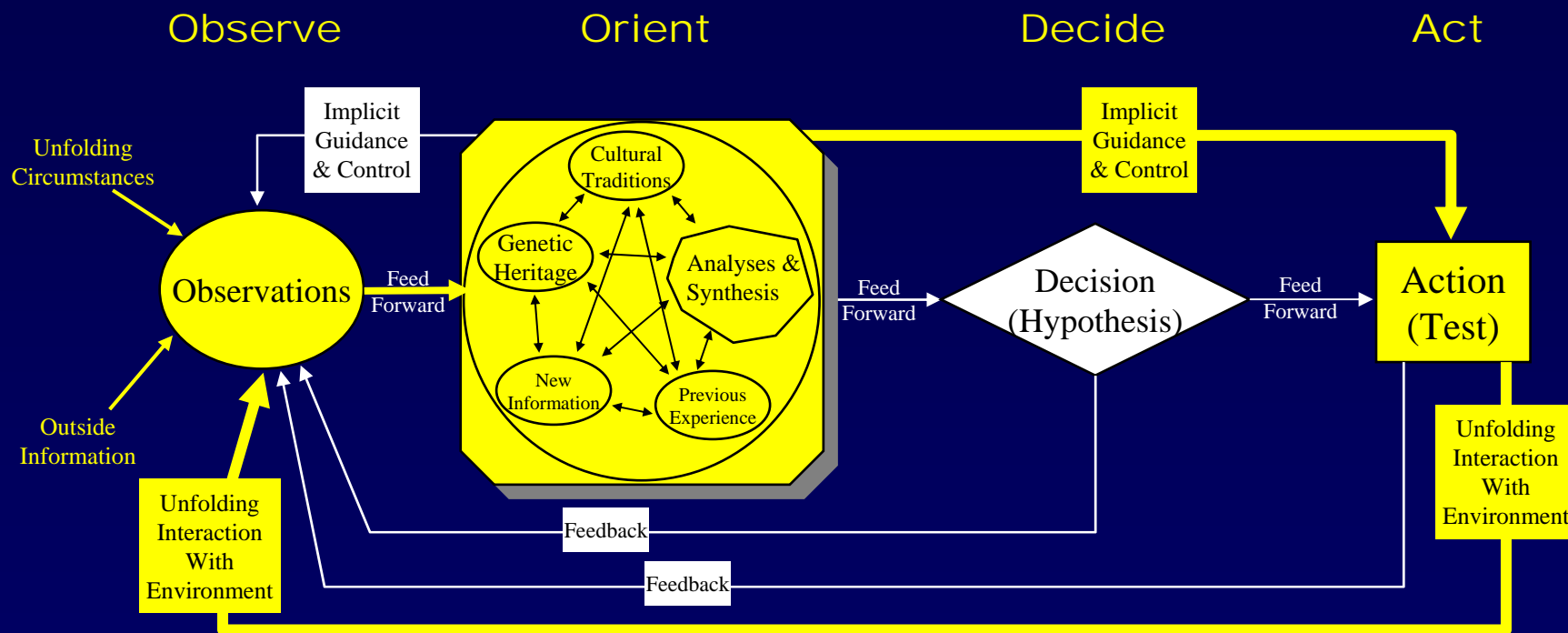


Remote C2 System





# Boyd's OODA Loops



From "The Essence of Winning and Losing," Col John R. Boyd, January 1996.  
Defense and the National Interest, <http://www.d-n-i.net>, 2001



# OODA Use Day to Day



- Humans process OODA loops continuously
  - Poor decisions are failures in the OODA loop
  - Katrina response was a failure in the OODA loop of individuals and organizations
  - A good employee is one that can process the OODA loop at their level
    - Vehicle maintenance checklists
      - Refuel the vehicle
    - Provide the status report
    - Provide course of action to address inadequate status for mission
- Sensors/Detectors process OODA loops according to a static or dynamic plan
  - Detector Processing - Sampling time, detection limit, alarm type
  - RDR Communication Node Processing -
  - RDR Command Post Processing -
  - IIMS Processing –
- In practice, OODA Loops need to address:
  - Bandwidth management
  - Processor management
  - Storage management







# NGCBBM System Approach

- Tie OODA Loop to common military functions
  - Data analysis
  - Asset status for a mission
  - Response checklists
- Generalize military functions
  - Generalize service specific functions
    - “The Army doesn’t do split MOPP”
  - Generalize event/status/entity functions
    - Runway / pier / shipping channel / road
- Use CBRN Data model as basis for the battle management system



# NGCBBM Data Base and Code Structure

Decision Making  
as a Function of Mission

Analysis – Resource Status – Response Plan



Mechanisms for Interaction with Resources

Sensors/Detectors and Actuators



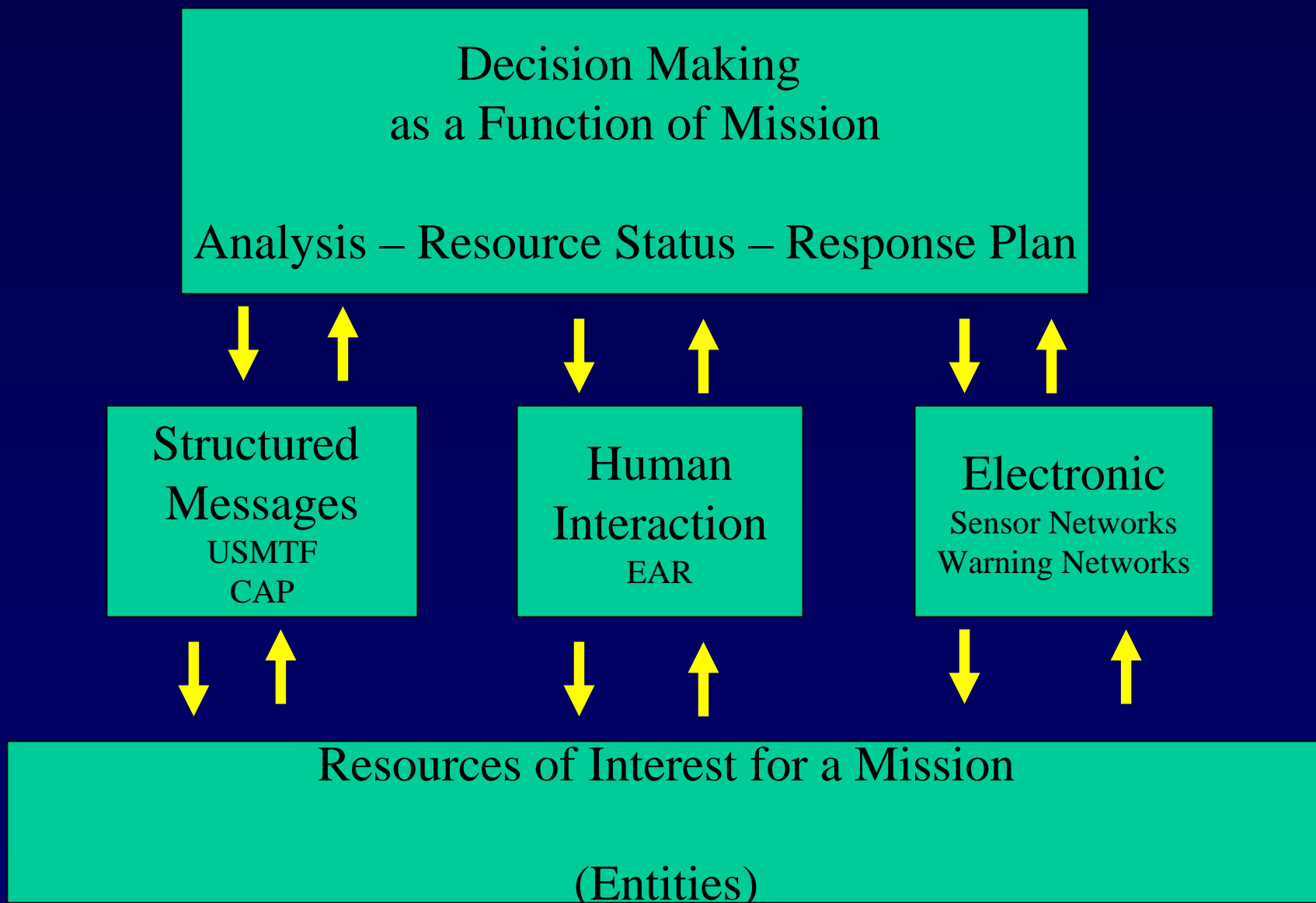
Resources of Interest for a Mission

(Entities)



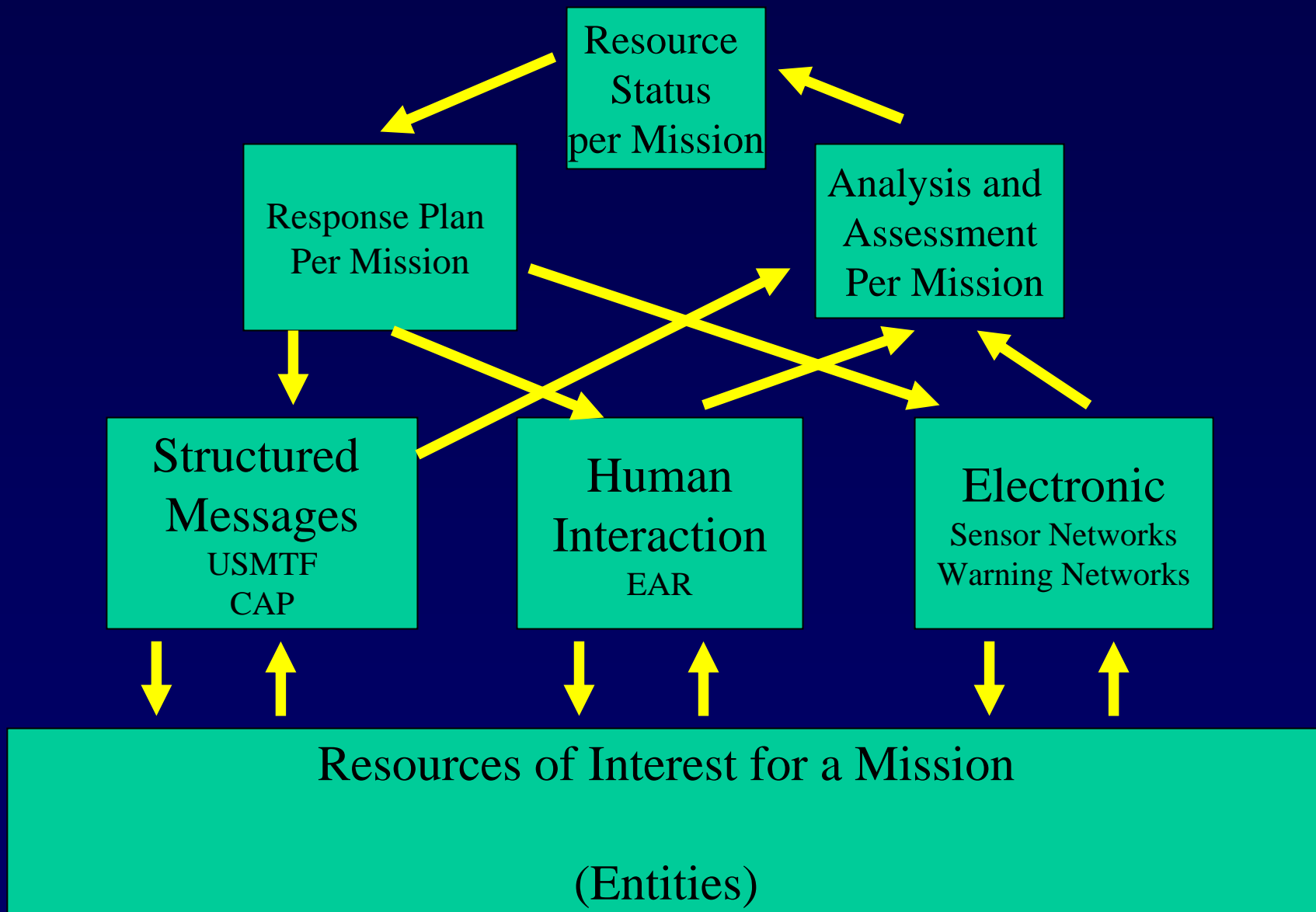


# NGCBBM Data Base and Code Structure





# NGCBBM Data Base and Code Structure





# NGCBBM Data Base and Code Structure



Entity\_Status  
 Mission Capability  
 ThreatCON  
 FPCON  
 Status of our resources for a specific mission

Action Event / Mission Plan / Support Plan  
 Sweep Assets w/ Consumables  
 Warn  
 Checklist  
 Battle Plan  
 Dynamic SME Response  
 Refuel  
 Eat/rest  
 Organizational Structure  
 Dynamic or planned events (act or sense) in response to status for a specific mission

Event\_Entity Analysis and Assessment  
 Data Point  
 SME Analysis  
 Automated Analysis  
 Tag  
 Model  
 Analyze events to determine entity status for a specific mission

Event\_Remote  
 USMTF  
 OTH Gold  
 CAP  
 EDXL  
 Reference data  
 Two-way interaction

Event\_Human  
 Sensor  
 Detector  
 Actuator  
 Action Request  
 Attack or Activity Report  
 Local event through  
 Human interface

Event\_Electronic  
 Sensor  
 Detector  
 Actuator  
 Local event through  
 Electro-mechanical interface

Entity / Entity\_Properties Features / Entity\_Allegiance  
 Region  
 Transportation Infrastructure  
 Utility Infrastructure  
 Platform  
 Facility  
 Equipment  
 Consumable  
 Individual  
 Country / Base  
 Organization  
 Entity is any resource that can be used to change the real world  
 Resources combined for a mission form a higher level entity

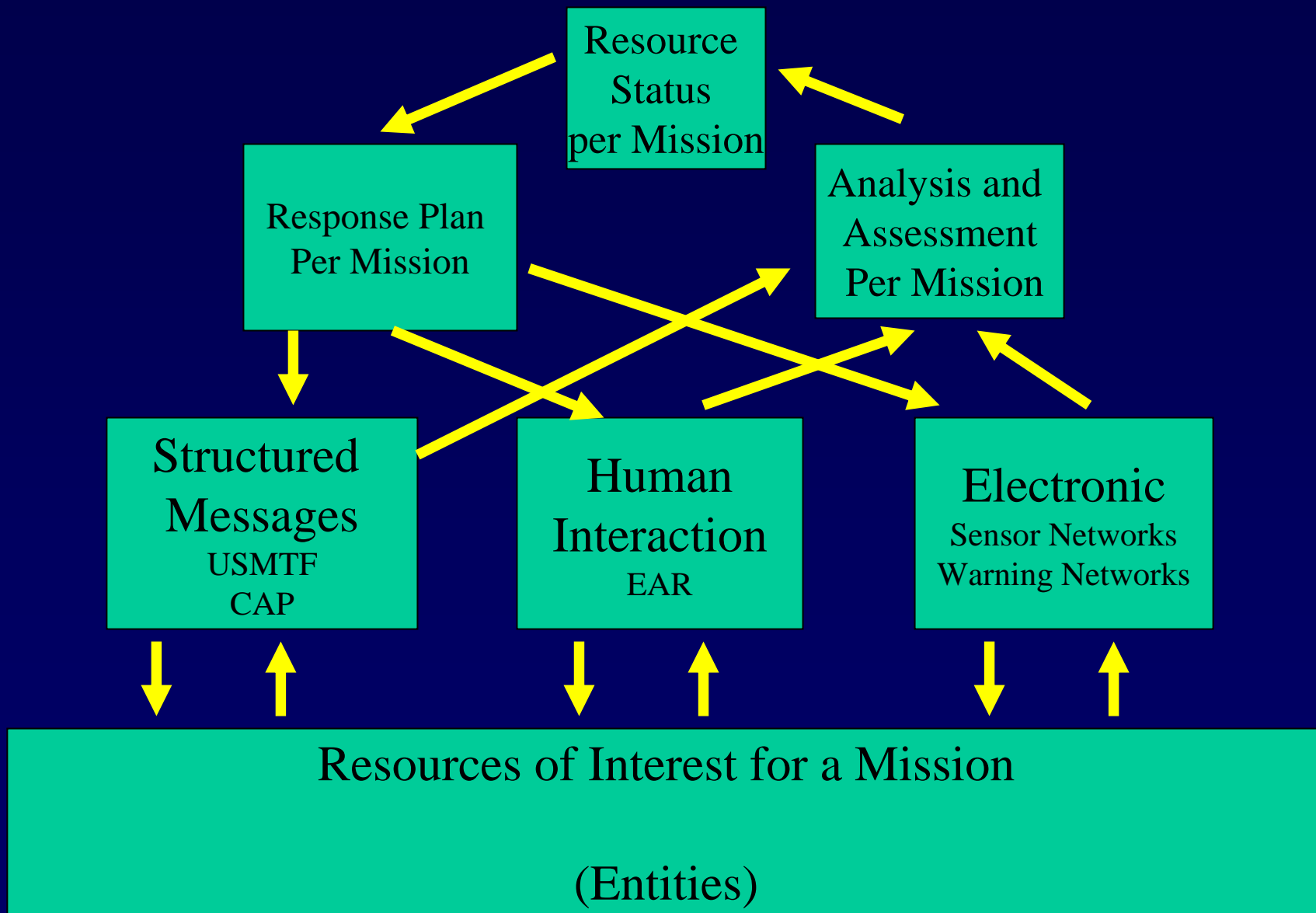


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# NGCBBM Data Base and Code Structure





# Data Acquisition

- **Reference**
  - Map Data
    - NGA
    - GeoBase
    - Commercial
  - Hot Links
  - Reference Databases
  - Reference Documents
  - Emergency Response Guidebook
- **Manual**
  - EAR
  - StatRep
  - Region or ThreatCON Status
  - Drawing Map Layers
- **Rapid Manual**
  - Sweeps
- **Information Extraction**
  - Patrol Debriefing Tool
  - Turbo Tax type interface
- **Streaming Electronic**
  - Portal Shield
  - Remote Data Relay
  - JCID
  - Force Protection Sensors
  - Met
  - GCCS Track Data
  - JWARN and JEM



# Sweep Interface

File Edit View Help HANSCOM AFB INFOCON: CHARLIE DEFCON: DELTA THREATCON: DELTA FPCON: DELTA DUTY : HAFB 66ABW NBC ONLINE

PortWARN Laptop

Map Emergency Response Guide Reference Docs Alerter RDR MET Warning NBC Message Center RECON System Reset Demo

SWEEP MGR - SWEEP(M-8 Paper)

Settings View Help

SWEEPS

M-8 Paper 2005  
M-8 Paper 2005  
Chemical 2005 L  
M8 2005-01-27 1

66 ABW NBC 66 ABW SP

66 ABW NBC Tea...	66 ABW NBC Tea...	66 ABW NBC Tea...	66 ABW RDR NBC ...
F-000... N P	F-000... N P	F-000... N P	? N P
F-000... N P	F-000... N P	F-000... N P	TEAM DONE
F-000... N P	F-000... N P	? N P	N P
F-000... N P	F-000... N P	TEAM DONE	
? N P	? N P	TEAM DONE	
TEAM DONE	TEAM DONE		

Map - North America

Scale 1:44716

Location: Lat/Lon(42.48116, -71.3162) DMS(422852N0711858W) MGRS(19TCH0962305800) Crash Grid(2.473, BB.551)

PROGMON - SWEEP(M-8 Paper)

Settings Help

TEAM CZONE SECTOR

SPECIAL TEA...	50%	6 of 12
66 ABW NBC	60%	6 of 10
66 ABW NBC...	50%	2 of 4
66 ABW NBC...	50%	2 of 4
66 ABW NBC...	100%	2 of 2
66 ABW SP	0%	0 of 2
66 ABW SP T...	0%	0 of 2

Attack ID: [ ] Classification: SECRET

Reported By: ABW NBC Team A

Bltd: 000068 Info To: HAFB 66ABW NBC

Reporter's Loc: F-000068

Loc: MGRS By: REILLY:HAFB 66ABW/NBC

Reporter's Org: [ ]

19TCH1267504995 From: HAFB 66ABW NBC

Reporter's Ph#: [ ]

Change Event ID

Event Time: 2005-02-16 9:30:58

M8

Recon Site/Pulse Point ID: [ ]

M8 Color:  Paper Changed?

Gold or Yellow (G-Nerve)  Concentration:

Pink or Red (H-Blister)  Heavy

Green or Blue (V-Nerve)  Medium

White (Uncontaminated)  Light

Current Remarks Add Remarks

HAFB 66ABW NBC REILLY 2/16/2005 9:31:29:  
EAR Autogenerated by SWEEP MGR



# Information Extraction

http://66.15.194.217 - Patrol Leader Portal :: Standard Patrol Debriefing Report - Microsoft Internet Explorer

File Edit View Favorites Tools Help

**Patrol Leader Portal**  [Log out](#)

**Standard Patrol Debriefing Report** Staff Sergeant John Lewis  
3rd Platoon, B Company 1st Battalion, 3rd Marines

[Debriefing Reports](#) | [Tactical Reference](#) | [Alerts](#)

**PATROL REPORT SUMMARY**  
Click on question number to modify answer.

**A. Size & Composition of Patrol**

1. How many personnel were in your patrol?  
45
2. How many vehicles?  
6
3. List the elements that composed your patrol and the number of persons in each  
Assault-10, Support-20, Security-16

**B. Tasks (mission)**

4. What type of patrol did you conduct?  
Combat
5. What type of combat patrol did you conduct?  
Security

**C. Time of Departure**

6. What was the departure time of the patrol?  
9-Sep-05 04:00





# CBRN Messaging

PortWARN Digital Dashboard - /C:/WARN/Dashboard/ddbs/IWARN\_DASHBOARD\_1280x800.ddb

Shuaiba | INFOCON: NORMAL | DEFCON: NORMAL | FPCON: NORMAL | DUTY : Battle Capt | ONLINE

Map | Emergency Response Guide | Reference Docs | Alerter | Device Networks | MET | Field Manuals | NBC Message Center

NBC Message Center

New | Import... | Copy | Edit | Delete... | Print... | Save As File... | CMPEXport | Plgt... | NBC-2 | EDR | Validate | Correlate | CMPStatus | Preferences...

Type	Originator	Message Creation Time	Classification
BIOCHEM1 - CHEM	IIMS	291427Z AUG 2005	Unclassified
BIOCHEM1 - CHEM	IIMS	291732Z AUG 2005	Unclassified
BIOCHEM1 - CHEM	IIMS	251850Z OCT 2005	Unclassified
BIOCHEM1 - CHEM	IIMS	252118Z OCT 2005	Unclassified
BIOCHEM1 - CHEM	IIMS	252133Z OCT 2005	Unclassified
BIOCHEM1 - CHEM	IIMS	252143Z OCT 2005	Unclassified
BIOCHEM1 - CHEM	IIMS	252153Z OCT 2005	Unclassified

Report View | Annotation

```
EXER/CWID 2005//
MSGID/BIOCHEM1/IIMS/-/-/-//
REF/A/MSG/L.MILLSK/291426Z AUG 2005/-/-//
GEODATUM/WE//
DTG/291427Z AUG 2005//
ORIGDDPT/NONE/CMD/US/TNG/NBC/SEC/HQSPT/NONE/J/USJ0034//
NBCEVENT/CHEM/-//
ALFA/-/-/-/-//
BRAVO/-/-//
DELTA/ATT:291426Z AUG 2005/-//
FOXTROT/382118N0770055W/EE//
GOLF/OBS/AIR/1/-/-//
INDIA/UNK/TA:BL0D/UNK//
TANGO/-/-//
GENTEXT/NBC INFO/-//
```

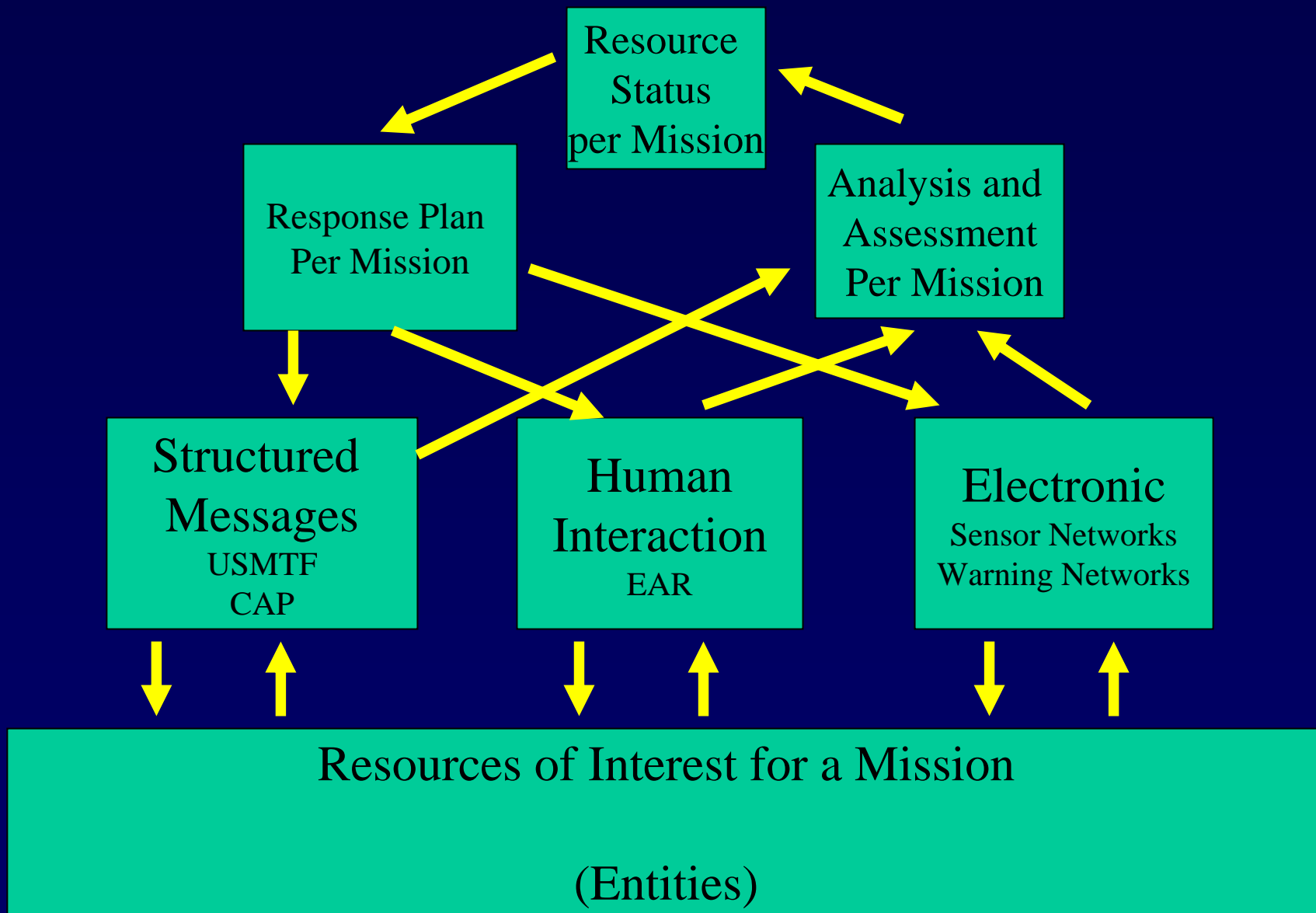


# CBRN Warning





# NGCBBM Data Base and Code Structure





# Information Cataloging and Aging



- I saw the cloud two hours ago
- I detected residue 30 min ago
- I saw the effects one hour ago
- I detected the cloud 115 min ago
- I modeled the cloud 90 min ago
- The CONOPS are ....
- Intel says the cloud would most likely have been ....
- Local newspaper reported in Oct\_03 .....
- DECON had this impact ....



# Information Tagging and Filtering

- Manual Tagging and Filtering
  - Plot on COP and Major Event List
  - Plot on Local COP and Major Event List
  - Region of Interest
  - Organization of Interest
  - Information Type of Interest
  - Information Topic of Interest
  - Classification
- Automated Tagging and Filtering



# Sensor Data

- When is sensor data significant enough to detect, record and report?
- Rules are built into the detector and the detector network
  - Do you know what the rules are and how they impact your high level data interpretation?
- How do you combine data collected under different rules?
  - Sampling bias



# Models



- Impact Regions (NBC 4-5-6) - Impact level on Region and Assets
  - Actual hazard on the ground
  - Hand drawn region
- Impact Region Models (predictive models) - Impact level on Region and Assets
- Transport and Diffusion
  - JEM
  - ATP-45
  - HPAC
  - ALOHA
  - VLSTrack
  - Met (e.g. precipitation)
  - Flooding
  - smoke
  - Other than attack
    - CAMEO
    - ALOHA
    - ERG
    - D2PC
- Operational Impact Models – Impact on Operations – Effect Models
  - Manual Status
  - JEM
  - JOEF
  - Heat Stress
  - Cold Stress
  - Smoke
  - STAFFS
  - Casualty Rates
  - NBC CREST
- Effects Calculators
  - NBC Planner
- Recovery Models
  - Resources required for Protection and Recovery
- Protection Effectiveness Models
  - None
  - Vulnerability Assessment Table (VAT)
- Flooding data
- Snow/Ice Storms
- Stability Category Wizard
- ITRANS
- Urban Dispersion Model
- MINT – Missile Intercept
- Passive and Active DECON Models
  - Is DECON needed or not?
  - What type of DECON is needed – Hasty vs deliberate, assets needed
  - Snowplow
  - Manual Measurement
- Course of Action Analysis
  - JOEF
  - Effects Based Operations
  - DECON Site Design
  - NCBR – show contamination of assets – ITT force decon.
  - Acquisition Analysis
- Probability Analysis



# Can You Run Your Model?

- CBRN Modeling Message is Needed
  - Ground contamination vs vapor
  - Sensor vs field observation
  - Vapor hazard vs liquid hazard
  - Sensors you don't own?
  - Models you don't own?
- Common Modeling Parameters which can be filtered based on Classification



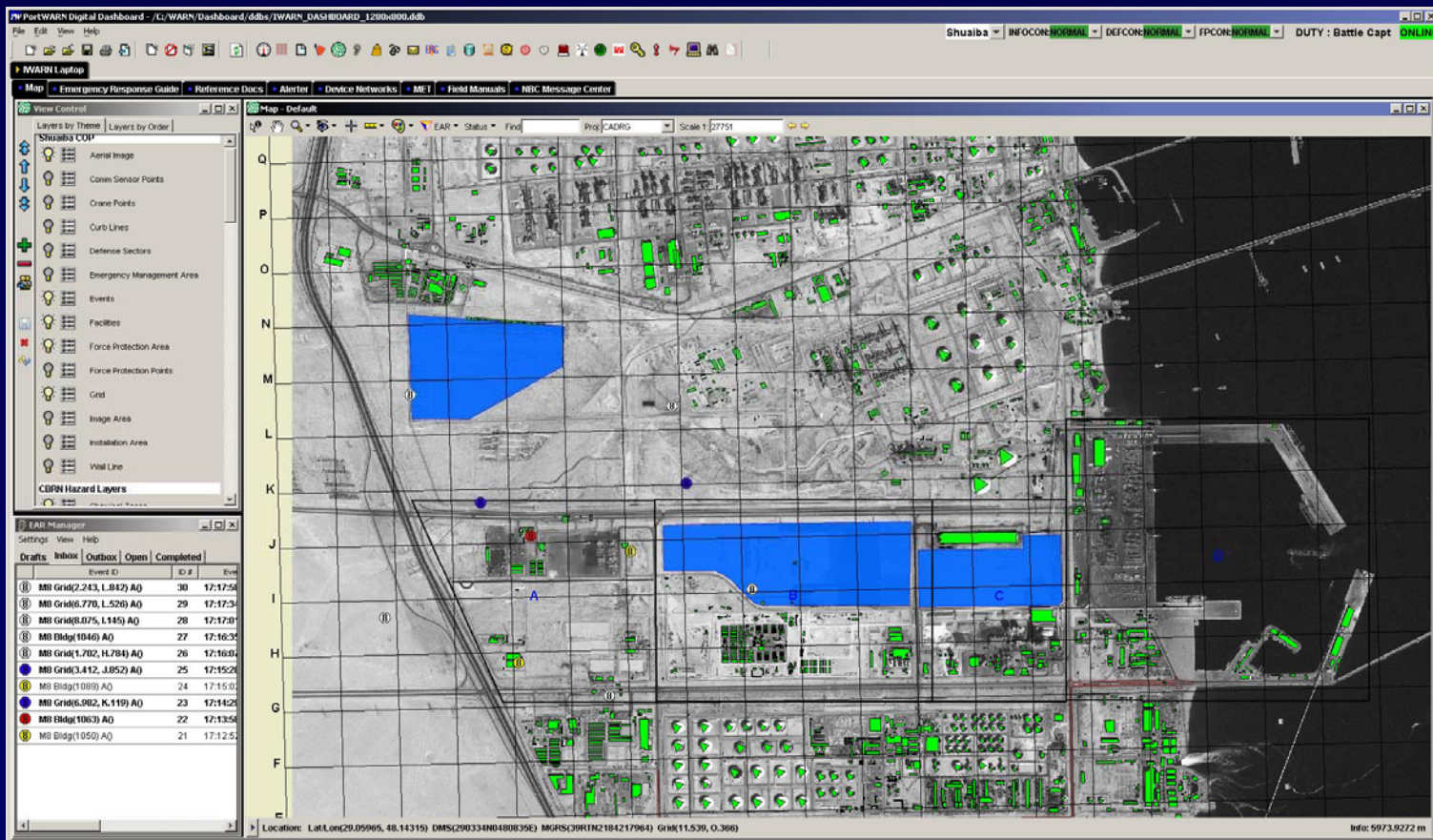


# Data Aging

- How do you convey the currency of detection?
- MCAD Passive IR Absorption detection lines can overwhelm the user
- Aging of detection lines based on:
  - Time
  - Wind
  - Other environmental parameters?
  - CHEMRAT
- Automated Chem Region Polygon generation and aging of the chem regions
  - Time
  - Wind
  - Other environmental parameters?
  - CHEMRAT
  - Decon
    - Falcon or GL1800
    - Water
    - Bulldozer



# M8 Detection



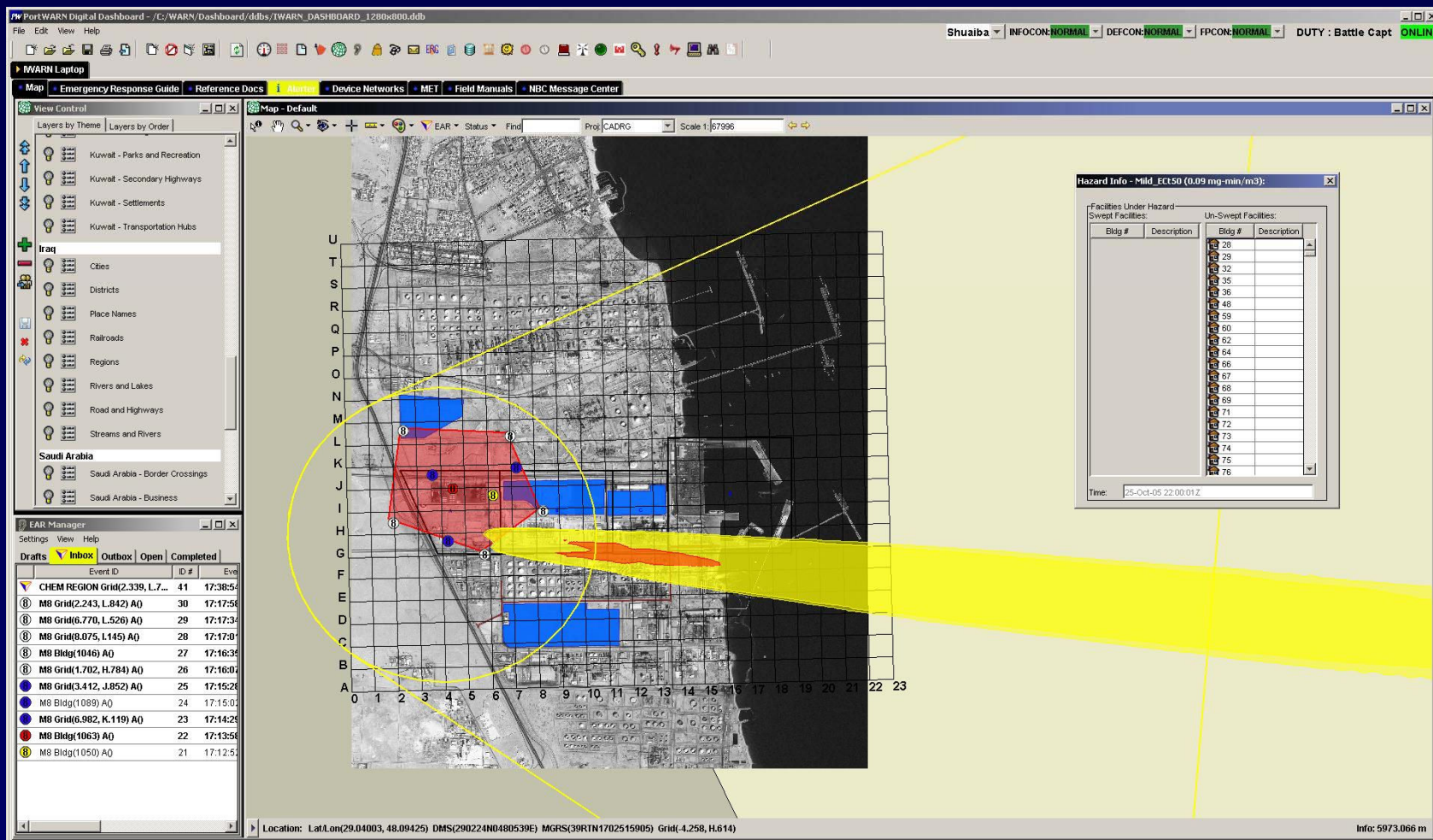
- Detections analyzed and believed to be real
  - SME evaluated the data points







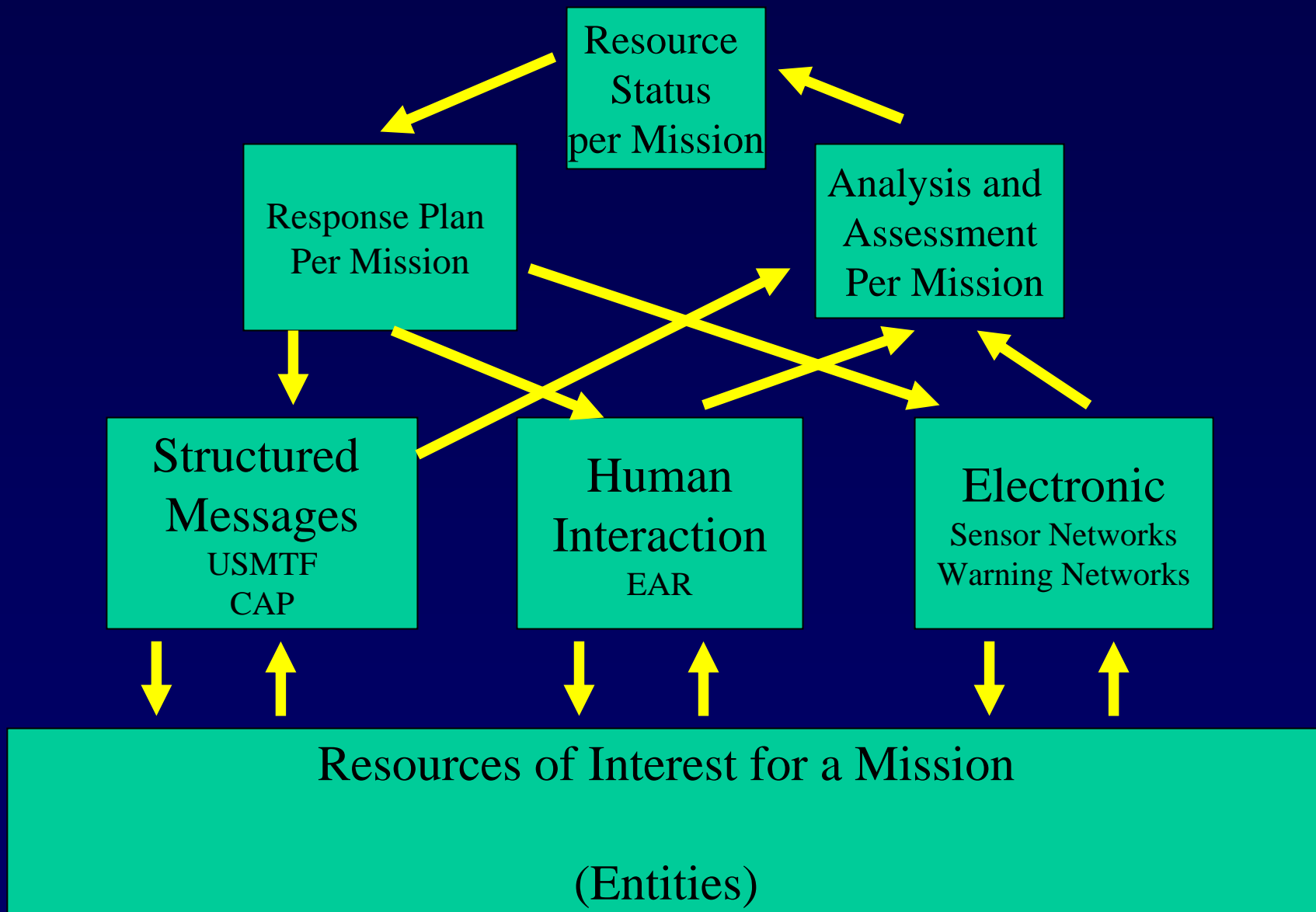
# Contaminated Region from Model



- Model predicts contamination levels based on detections and formalized SME
  - Automated tagging of data points to region and resources in it



# NGCBBM Data Base and Code Structure







# Status Summary and CON Toolbar

W I-WARN Digital Dashboard - D:\Projects\ROIM\SP11\SP11\source\LIB\ddbfa.ddb

File Edit View Help    BMTX    INFOCON: NORMAL    DEFCON: NORMAL    THREATCON: NORMAL    FPCON: NORMAL    DUTY : X-OBSERVER-X    ONLINE

Status Manager    Heat Cell    OpenMap    Data Manager    EARMGR    Phone Logs    Chat Logs

### Status Manager

LOC    ORG    ALERT

Expand All    Collapse All

Show Status:

THREATCON

- FEMA I
- FEMA II
- FEMA III
- FEMA IV
- FEMA V
- FEMA VI
- FEMA VII
- FEMA VIII
- FEMA IX

Add LOC    Remove LOC

#### Location - United States - FEMA I

Add    Remove    Update

Status	Condition	Description	Time
Communications	NMC		11:46:36 3-21-2005
Mission Capability	NMC		11:46:36 3-21-2005
MOPP	0		11:46:36 3-21-2005
THREATCON	BRAVO		11:46:36 3-21-2005

### Status Manager

LOC    ORG    ALERT

Expand All    Collapse All

Show Status:

None

None

Laundry

Communications

MOPP

Mission Capability

THREATCON

- United States
  - Alabama
  - Alaska
    - Aleutians East
    - Aleutians West
    - Anchorage
  - Arizona
  - Arkansas
  - California
    - Alameda
    - Alpine
    - Amador
  - Colorado
    - Adams
    - Alamosa
  - Connecticut

Add LOC    Remove LOC

#### Location - Afghanistan

Add    Remove    Update

Status	Condition	Description	Time
Communications	DG		18:25:38 11-8-2004
Mission Capability	PMC		18:25:38 11-8-2004
MOPP	0		18:25:38 11-8-2004
THREATCON	ALPHA		18:25:38 11-8-2004

### Map - Default

Map of the United States with FEMA I regions highlighted in yellow and blue. A red pin is located in the central US.

Location: Lat/Lon(8.671875, -92.7963) DMS(084018N0924746W) Info:

### View Control

Layers by Theme    Layers by Order

- Gulf Coast Counties
- LA. County
- Lat-Lon Grid
- Mexico States
- US Counties
- US Roads
- US States
- UTM Grid





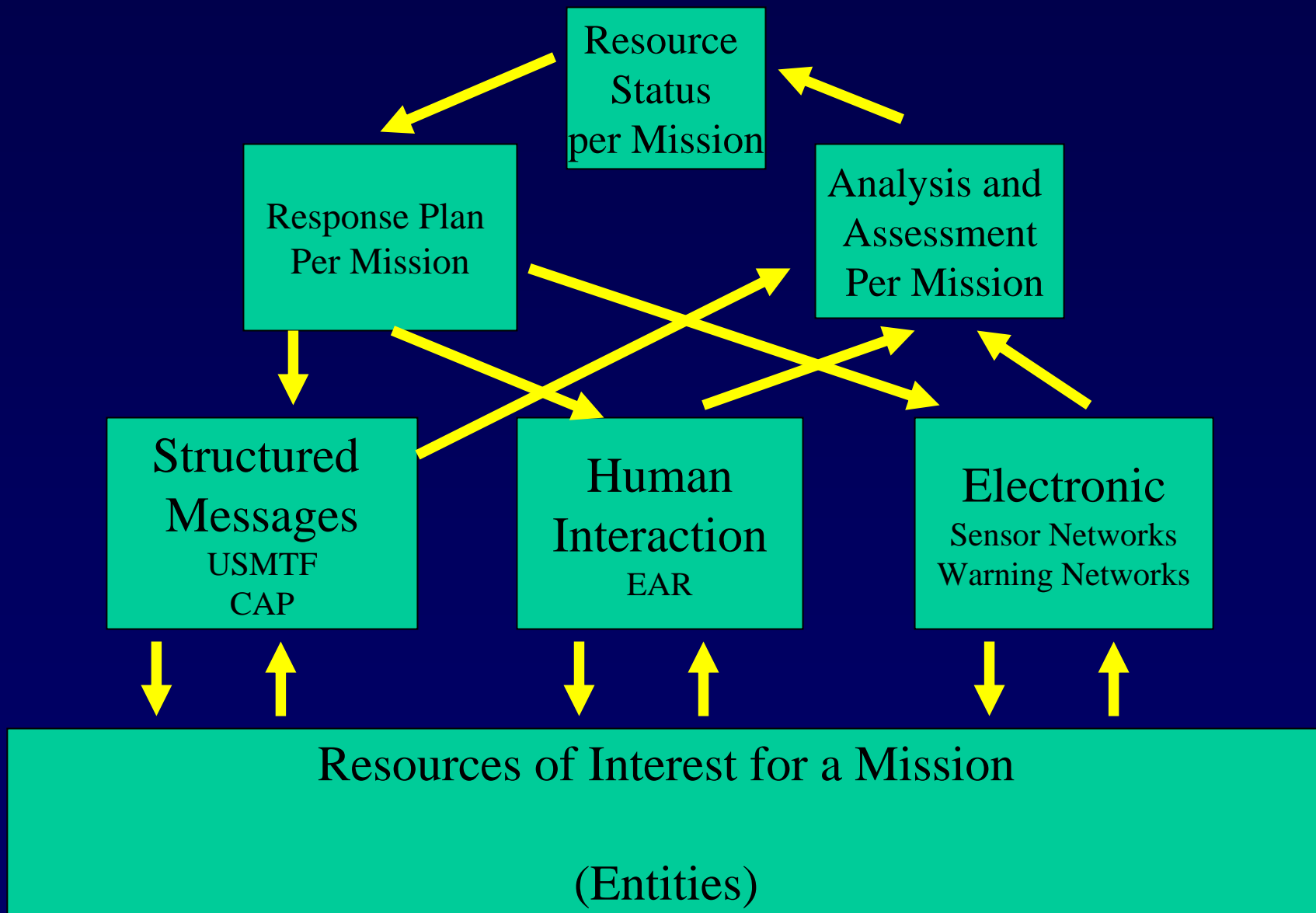
# Status of Which Resource?

- “Detector Faulted” is the status of the detector
  - May imply unknown status for region
- “Detector Clear” is the status of the point
  - May imply known status for region
- “Detector Alarm” is the status of the point
  - May imply known status for region
- “Comms Down” is the status of the network
  - May imply unknown status for region
- “MOPP None” is the status of the region
  - Implies MOPP status for all resources in the region





# NGCBBM Data Base and Code Structure





# Response Plans

- No Timeline
  - Simple checklist
- Static PowerPoint with Timeline
- Electronic Timeline
- Electronic Timeline with Resource Conflict Notification
- Electronic Timeline with Suggested Courses of Action





# Guidance



- **Passive Guidance**
  - Display of Contaminated Regions
  - Reference Documents (CONOPS, ATSO Guide)
  - Static Response Plan (PowerPoint)
  - Databases (Emergency Response Guide)
- **Active Guidance**
  - What do I need to be reminded of?
  - What information do I need to run a different model?
  - Sensitivity Analysis – How critical are the different parameters in a model?
  - Sensor Placement
  - What information would change my understanding of the situation around me?
  - Asset conflicts in response plans
  - Suggested Course of Action



# Active Guidance

- Given:
  - Assets in a Region
  - Asset work load
  - MOPP Condition
  - Weather
- Provide Guidance on:
  - Time assets in MOPP
  - H2O Consumption
  - Work Rest Cycle
  - Total work time per shift
- Provide Inputs for Operational Throughput Models



# Heat Index Guidance

W I-WARN Digital Dashboard - /D:/Projects/ROIM/SP11/SP11/source/LIB/ddbs/a.ddb

File Edit View Help

BMTX INFOCON: NORMAL DEFCON: NORMAL THREATCON: NORMAL FPCON: NORMAL DUTY : X-OBSERVER-X ONLINE

Status Manager Heat Cell OpenMap Data Manager EARMGR Phone Logs Chat Logs

### Work Rest Guidance - Work Cycle Guidance

Meteorology Data Source: Manual Real Exercise

Work Cycle Guidance Work Shift Maximums Reference Work Intensity Reference Heat Index Reference

Cycle Started	Zone	MOPP	Time In MOPP	Time Before Next Cycle	Heat Index (F)	Ambient (F)	MOPP over Underwear								MOPP over Battle Dress Uniform								
							VL		L		M		H		VL		L		M		H		
							VWR	qt/hr	VWR	qt/hr	VWR	qt/hr	VWR	qt/hr	VWR	qt/hr	VWR	qt/hr	VWR	qt/hr	VWR	qt/hr	
2004-10-20 11:25:53	A	MOPP 4	5 days 21 hours 21 minutes	58 minutes	87.5	84.0	NL	1.0	NA	NA	NA	NA	NA	NA	NL	1.0	NA	NA	NA	NA	NA	NA	NA
2004-10-10 13:20:46	B	MOPP 2	12 days 20 hours 18 minutes	53 minutes	87.5	84.0	NL	1.0	NA	NA	NA	NA	NA	NA	NL	1.0	NA	NA	NA	NA	NA	NA	NA
2004-10-04 10:31:20	C	MOPP 4	18 days 20 hours 34 minutes	4 minutes	87.5	84.0	NL	1.0	NA	NA	NA	NA	NA	NA	NL	1.0	NA	NA	NA	NA	NA	NA	NA
2004-10-17 13:19:36	D	MOPP A	12 days 20 hours 18 minutes	52 minutes	87.5	84.0	NL	1.0	NA	NA	NA	NA	NA	NA	NL	1.0	NA	NA	NA	NA	NA	NA	NA
2004-10-03 13:03:24	E	MOPP 4	5 days 21 hours 20 minutes	36 minutes	87.5	84.0	NL	1.0	NA	NA	NA	NA	NA	NA	NL	1.0	NA	NA	NA	NA	NA	NA	NA

Map - Default

View Control

Layers by Theme Layers by Order

Beaumont COP

- Aerial Image
- Aerial Image bw
- Assembly Areas
- Coast Line
- Crane Points
- Crash Grid
- Decon Sites
- Defense Sectors
- Events
- Facilities
- Harbor Area
- LCR Line

Location: LatLon(30.07718, -94.0747) DMS(300437N0940428W)

Info:





# Example 1

- Detect or observe chemical incident
- Analyze data by SME or model to determine impact on entities
- Set status of entities for specific missions
  - Flying mission
  - Water table protection
- Determine response by SME or according to preset plan
- Act as required by response
- Monitor resources and re-calculate status

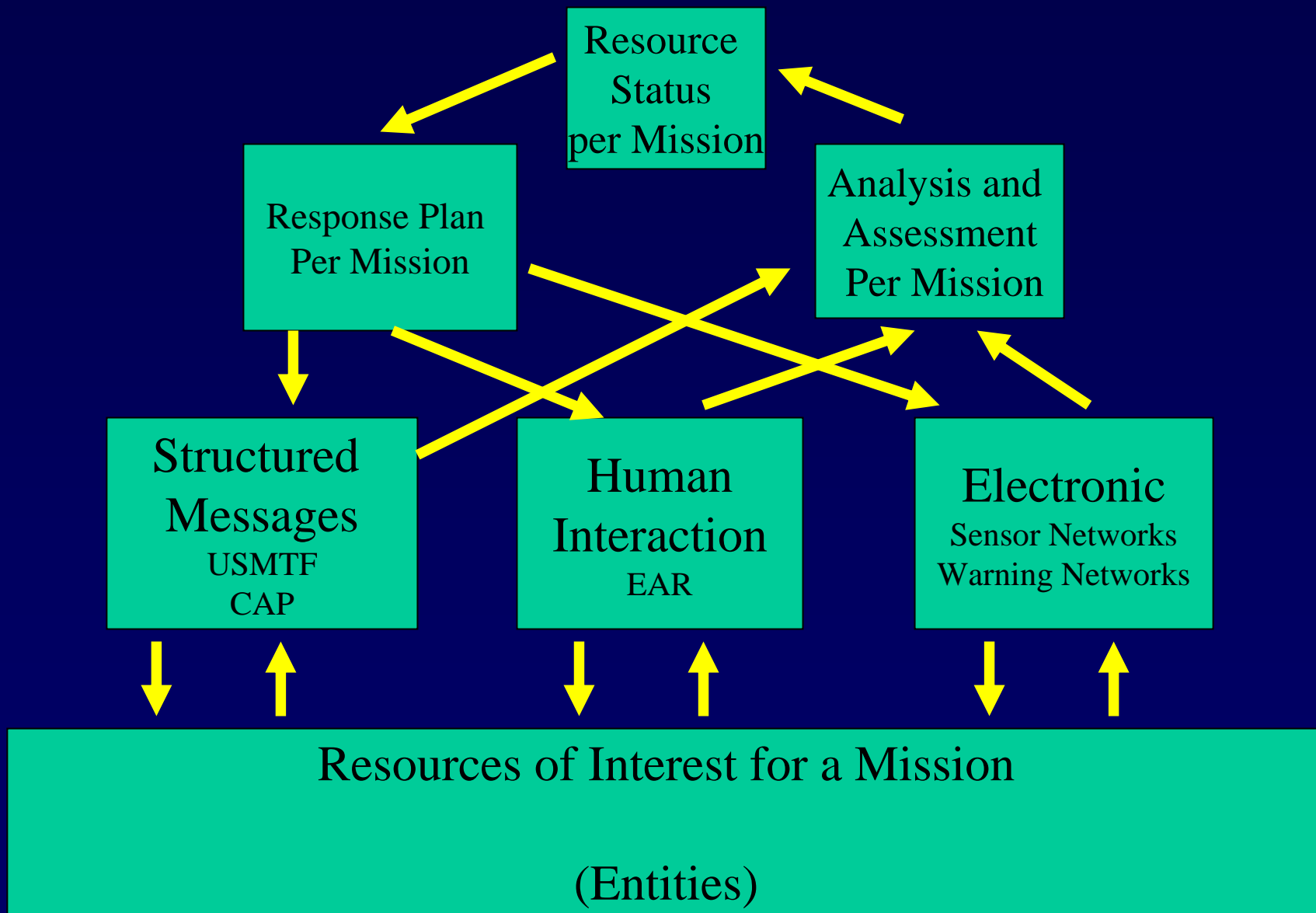


# Example 2

- VIP visit reported
- SME confirms it will happen and determines impact
- Change FPCON status
- FPCON change triggers new response plan
  - Change detector sampling rate and deployed forces
- Analyze data for indication of incident
- ....
- VIP visit reported over



# NGCBBM Data Base and Code Structure





# CBRN Information Management



- Capture the information in a format you can process
- Experienced humans appear to assume or skip steps – but the steps are accomplished
  - Build all the steps into your Battle Management System
- Automated systems tend to have hard coded steps – system can't adapt
  - Design automated systems to be adaptive
- Regardless of how the change in state is initiated, change must be in a standard format and subject to a standard process
- Non-CBRN Information Management is the same
  - Intel



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  - Sensor / Actuator interaction
  - Analysis and assessment
  - Status
  - Response plans
- Examples of Operational Environment System Configuration
  - Data Acquisition
  - Operation Across Guards
  - Multi-level Data Processing
- Conclusions



# Chem/Bio Battle Management



Portal Shield  
Detector Network



One-Way  
Link



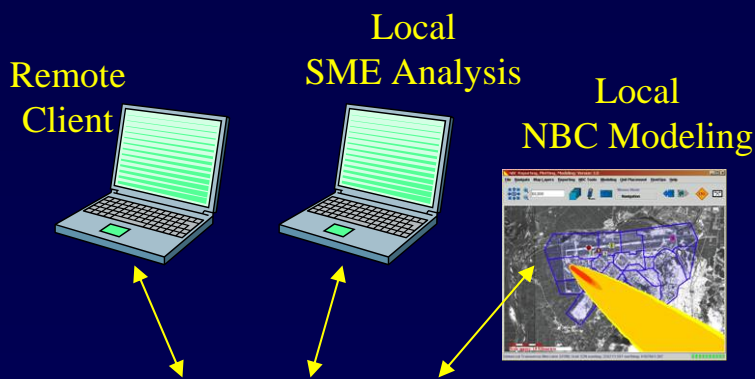
One-Way  
Link

Remote Data Relay  
Detector Network



Remote Data Relay  
Warning Network

One-Way  
Link



Remote  
NBC Modeling  
(JEM)



One-Way  
Link

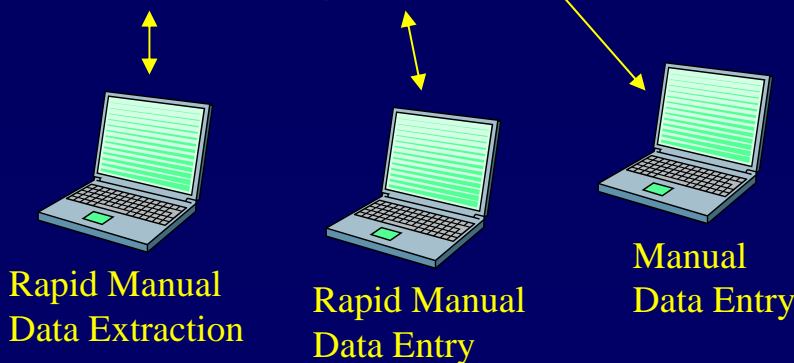


Survival Recovery Center

Potential  
Comm Link



Remote C2 System



Remote  
SME Analysis  
(JWARN / JOEF)





# Multiple Level Security Networks

- Multiple Networks
  - Detector
  - Local C2
  - Higher Level C2
- Network Links
  - Detector to Local C2
    - Fat Finger
    - Sneaker Net
    - One-way Fiber
  - LAN C2 to WAN C2
    - Fat Finger
    - Sneaker Net
    - Database replication through ISSE and other Guards
      - Classification rules?



# Network Centric Operations

- Stand Alone Client
- LAN
  - EARs
  - Shared Map Layers
  - Shared Database
- Multiple WANs
  - Common Message Parser and Email
  - CBRN Messages
  - Common Alerting Protocol
  - USMTF
  - XML



# Network Dependency of Mission Critical Systems

- Network Centric is Great
- Network Dependent is Network Vulnerable
- A local system must continue to operate when the network doesn't
- Information must be processed on different security level networks
  - Information Objects must include a WWID with a MAC address and history of changes



**OGA Networks**  
 FEMA, MEMA, BEMA, O'Neill

**IIMS Thin Clients**  
 IP Addresses:  
 O'Neill Fed Building - 159.142.10.250  
 Maynard ROC - 166.112.210.188  
 Boston FEMA - 166.112.74.62

UST 2.05 Network Schema  
 RDRs at O'Neill Fed Building and Fleet Center  
 4May04

**O'Neill Fed Building Network**

**Data Distributor:**  
 - One way fiber receive from RDR CP  
 - Ethernet link to MACA  
 - @ O'Neill Building  
 - Gateway Desktop  
 - Win2K  
 - IP: 159.142.10.250

**RDR Comm Node:**  
 - Two way RF and/or Ethernet link to RDR CP  
 - Hardwire link to sensors/detectors

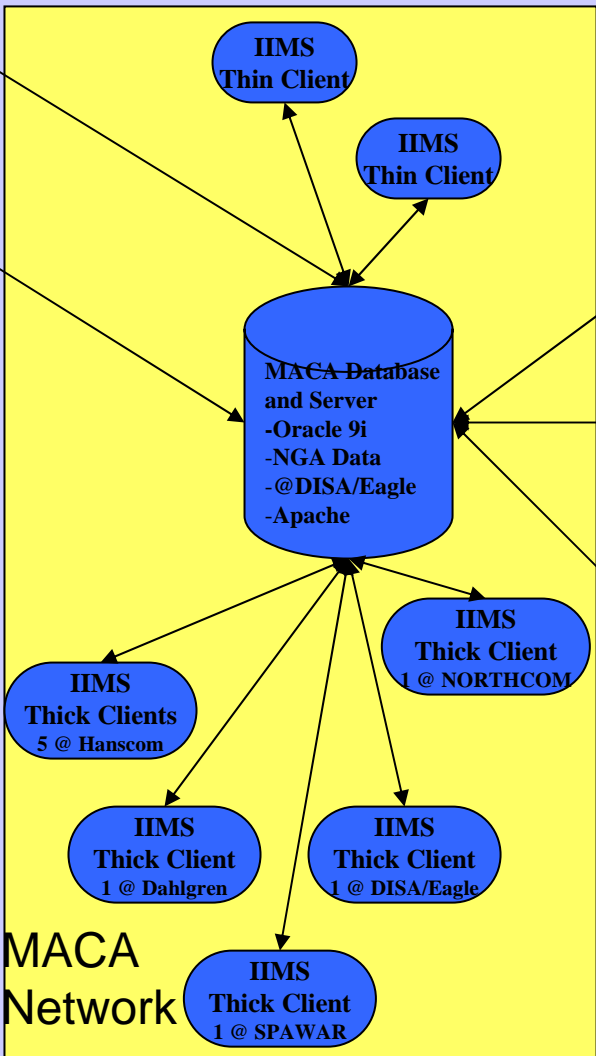
**RDR Command Post:**  
 - Two way RF and/or Ethernet link to RDR Nodes  
 - Access Database  
 - One way fiber send to MACA  
 - Gateway Desktop  
 - Win2K

**RDR Comm Node:**  
 - Two way RF and/or Ethernet link to RDR CP  
 - Hardwire link to sensors/detectors

**Detector Network @ Fleet**

Access Control List @DISA/Eagle through Port 80

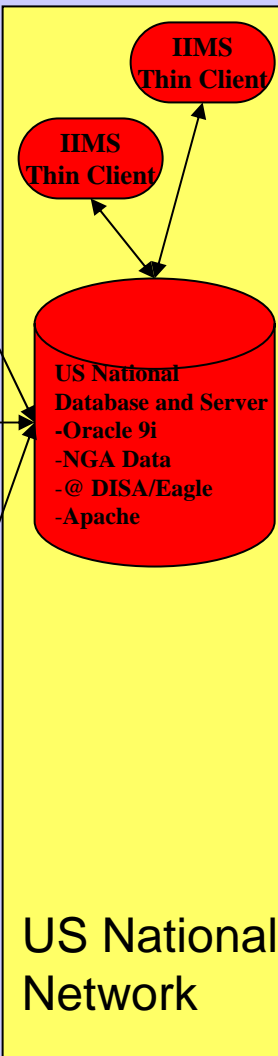
Access Control List @DISA/Eagle through Oracle Ports



SneakerNet

ISSE guard - Email UST 1.10 @ NORTHCOM

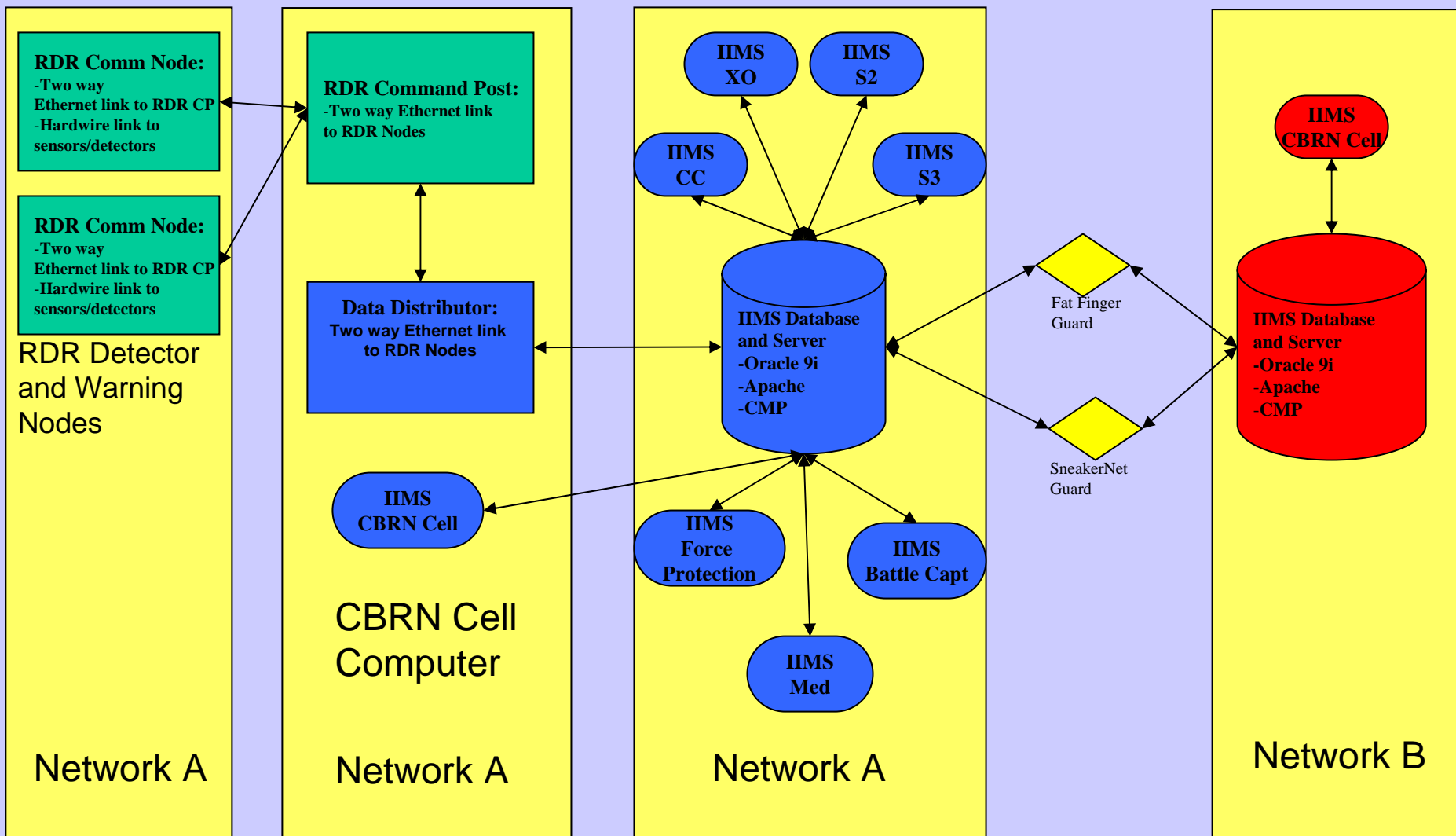
ISSE guard - Database Replication UST 1.10 @ NORTHCOM





# IWARN Test Schema A

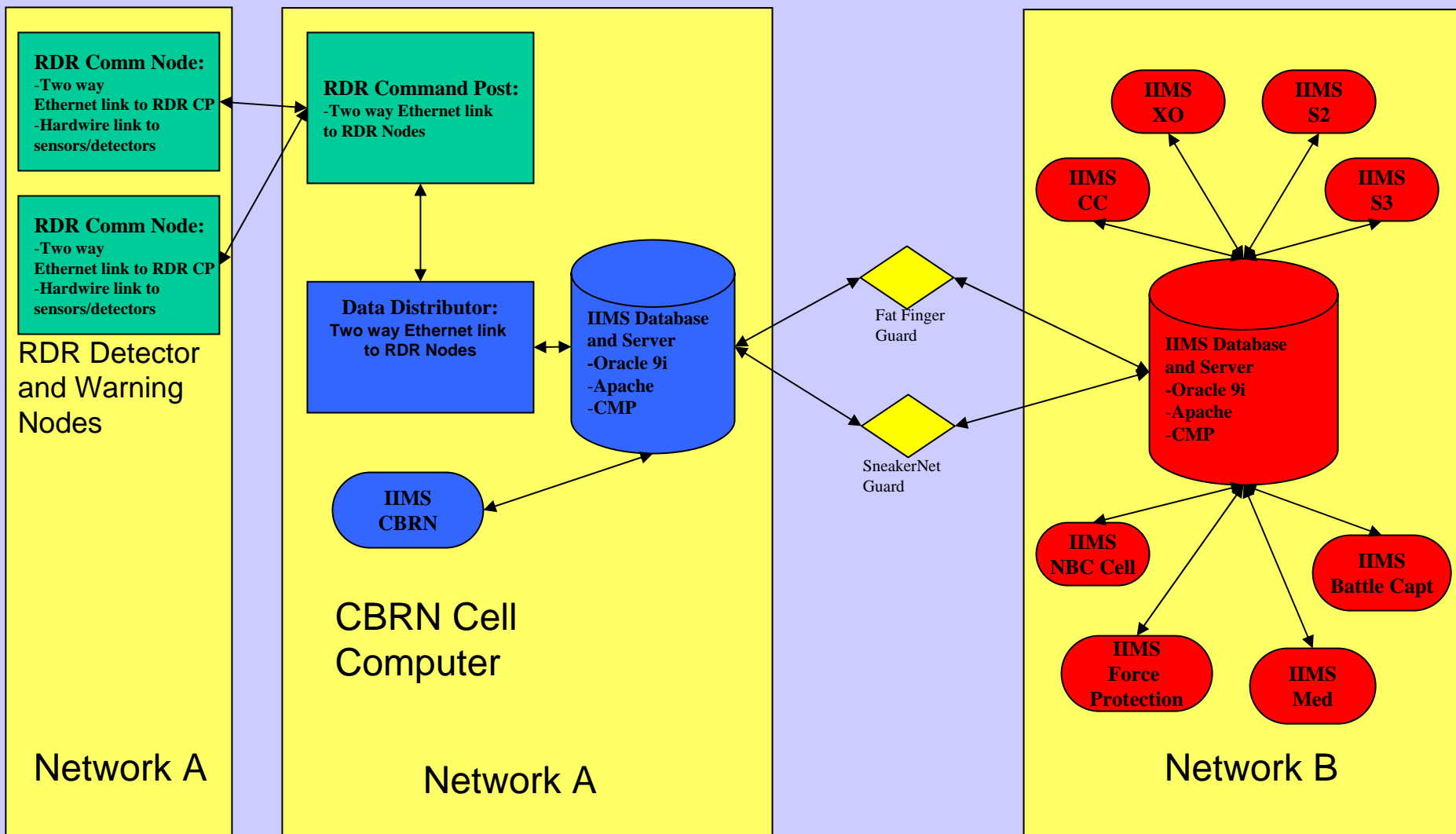
24 Oct 2005





# IWARN Test Schema B

24 Oct 2005



Network A

Network A

Network B





# Outline

- Overview of CBRN Battle Management
  - Battle Management Decision Loop
  - CBRN Data Model
  - NGCBBM Decision Loop
- Examples of CBRN Information Management
  - Sensor / Actuator interaction
  - Analysis and assessment
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- Examples of Operational Environment System Configuration
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- Conclusions



# Adoption of the CBRN Data Model

- Does it support all CBRN information management steps?
  - What types of information management can the applications using the C2IEDM data model do now?
- Does it support all CBRN network configurations?
  - What network configurations can the C2IEDM data model support now?
- How do we transition to the CBRN Data Model?
  - Tailor model?
  - Tailor code?
  - Both?



# Transitioning Technology to the Warfighter

## (Parallel Spiral Development)

- **Create a Receptive host for Tech Transition**
  - Provide a C2 Backbone for researchers to build against
  - Integrate mature IT products using ACTDs
  - Technically and Operationally Test concepts for Military Utility
  - Transition to either Core Programs or existing Battle Management Systems
- **Field technology, solutions, and CONOPS**
  - Build on success
  - Add components
  - Provide blue print for NBC Battle Management
  - Generalize the solution to address joint CONOPS
  - CONOPS and Technology leapfrog

