



Next Generation Chem Bio Battle Management Integrated Information Management System

2007 Chemical Biological Information Systems
Conference & Exhibition
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Agenda

- Favorite slides from the project
 - How we got here
- OODA Loop
 - Data, information and knowledge flow in IIMS
- IIMS Capabilities and Battle Management Issues
- What still needs to be done





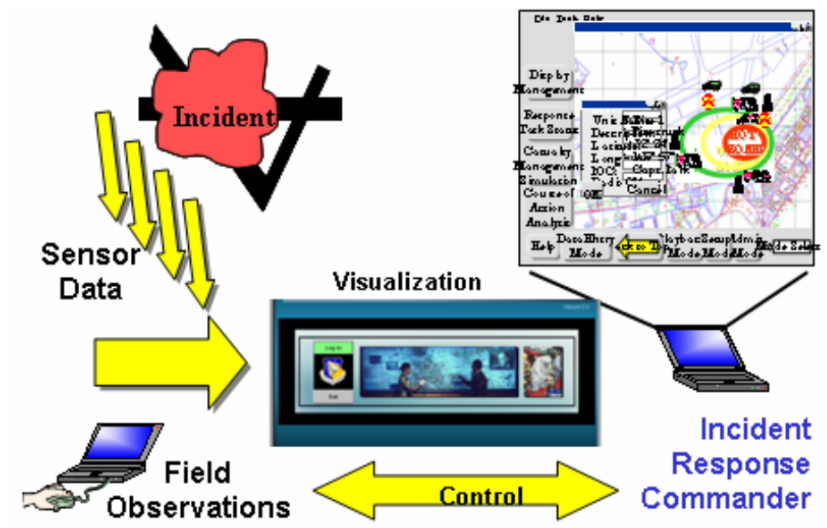
Next Generation CB Battle Management



Jim Reilly, AFRL/IFSF

Objective: Develop a program leveraging existing, multi-mission sensors to support a NBC sensor fusion and battle management capability.

Description of Effort: Existing and proposed MASINT sensor systems will be examined and a means developed for tracking and fusing information from passive, active and human data sources used to detect and track chemical and biological attacks. Technologies from the Control of Agent-Based-Systems, Effects Based Operations and the Joint Warning and Reporting Network programs will be used to integrate sensor systems and command and control systems.



Benefit to Warfighter: Warfighting elements will be provided an immediate CB situational awareness, links to sensors, and a capability to disseminate fused information to appropriate decision makers for in-time response to detected threats.

Challenges:

- Representation of sensor data to support automated reasoning
- Handling uncertainty in sensor data in near-real time
- Control of heterogeneous sensors and decision-making systems

Maturity of technology: Advanced Technology Development (6.3)

Business Area: Information Systems Technology

Major goals/milestones by FY:

- FY04: Integration of sensors and reasoning framework
- FY05: Support for management of data uncertainty
- FY06: Delivery and test of initial capability (end-to-end)
- FY07: Delivery and test of enhanced capability (increased #'s of sensors, multiple decision-making threads)

Funding (\$K):

	FY04	FY05	FY06	FY07	Total	
	6.2	500	700	500	400	2,100

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Battle Management Spectrum

<u>Fixed Site (RestOps)</u>	<u>Expeditionary Site (CASPOD)</u>	<u>Mobile Site</u>	<u>Incident Response (IMCR)</u>
Fixed Participants	Know Participants	Know Participants	Unknown Participants
Fixed Infrastructure	Portable Infrastructure	Mobile Infrastructure	Any Infrastructure
Well Defined Mission	Defined Mission	Defined Mission	Save Lives
Train Together	Coordinated CONOPS	Coordinated CONOPS	Limited or No CONOPS
Years to prepare	Weeks to Prepare	Hours to Prepare	Hours to Prepare
Single Platform	Multiple Platforms	Multiple Platforms	Any Platform





The Path followed

2003 RestOps

2004 JWID

2004 Beaumont

2005 CWID

2005 Kuwait AS

2006 Kuwait KNB

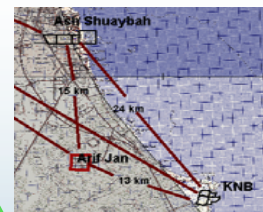
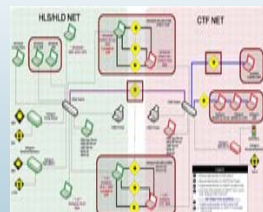
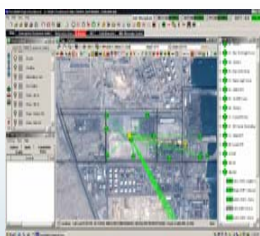
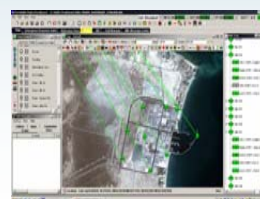
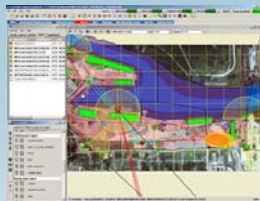
2006 CWID

2006 JOEF

2007 IE-Ku??

2007 CWID

RestOps
CASPOD
NGCBBM
Shared COP
AF 46th TS



Chem/Bio Battle Management



Portal Shield
Detector Network



One-Way
Link



One-Way
Link

Remote Data Relay
Detector Network



One-Way
Link

Remote Data Relay
Warning Network

Remote
Client



Local
SME Analysis



Local
NBC Modeling



Remote
NBC Modeling
(JEM)



Survival Recovery Center

Potential
Comm Link



Remote C2 System



Rapid Manual
Data Extraction



Rapid Manual
Data Entry



Manual
Data Entry



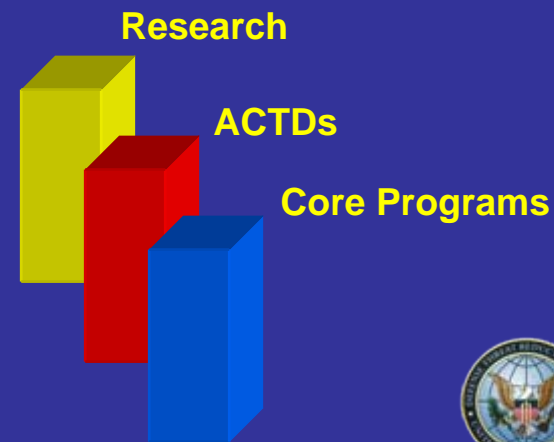
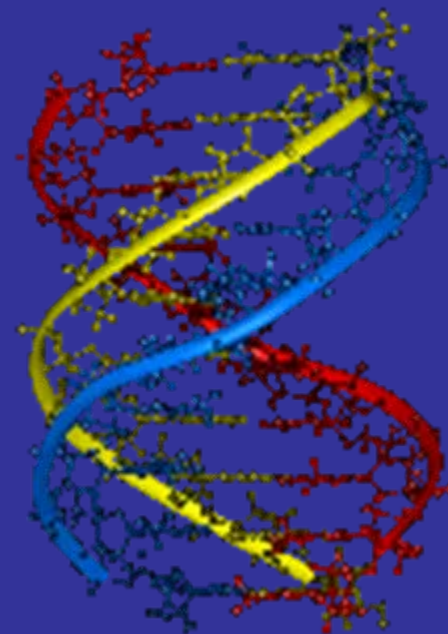
Remote
SME Analysis
(JWARN / JOEF)



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





Observe, Orient, Decide and Act Loop

Data, information and knowledge
flow in IIMS





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?



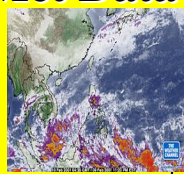
Battle Space



Force Protection



Met Data



Hazard Models



NBC Recon



**Battlefield
Situational
Awareness**

Attack Events



Sensor Data



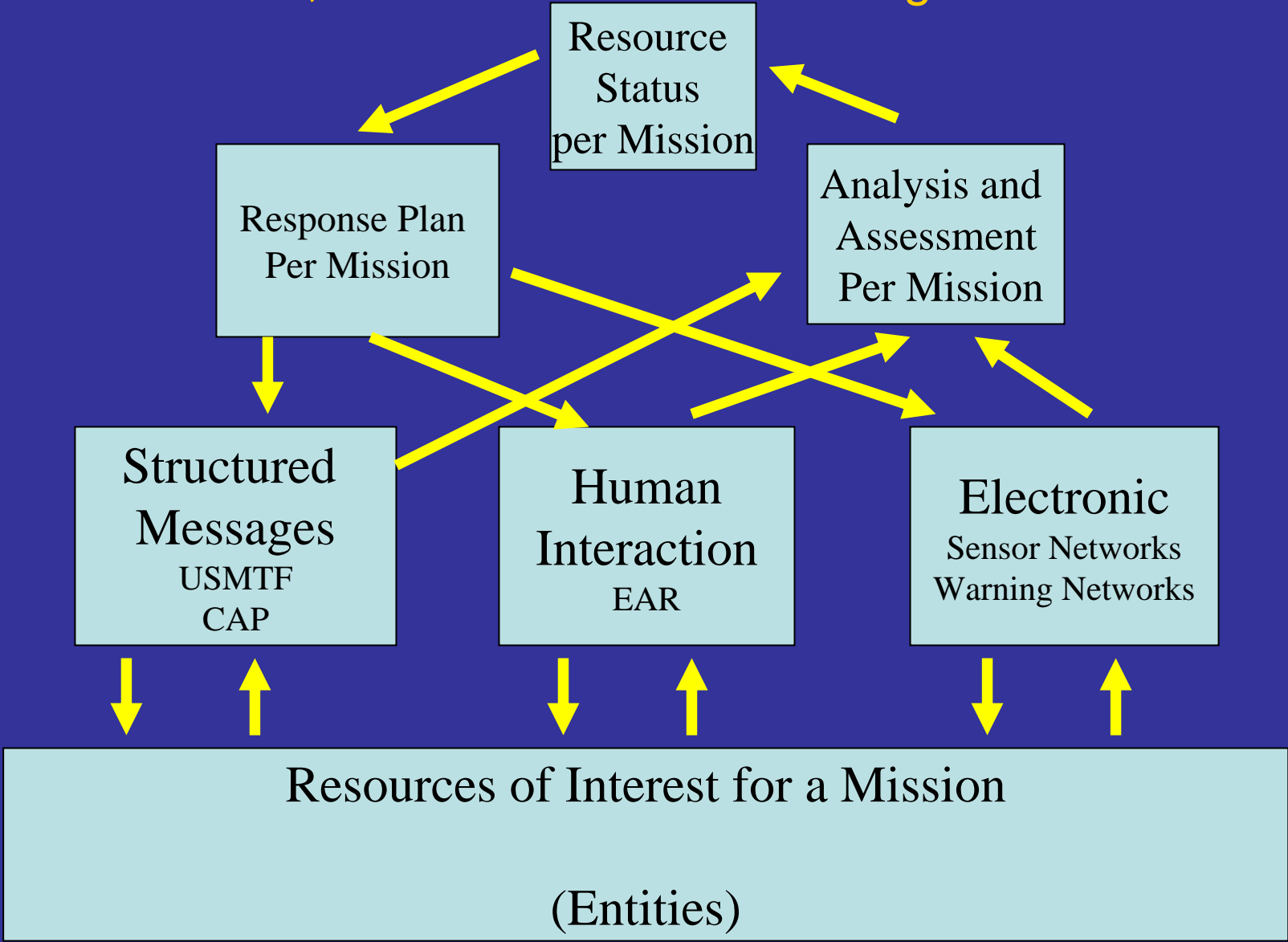
Operational Status

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



Battle Management

Data, Information and Knowledge Flow



Battle Management Data, Information and Knowledge Flow



Consequence Management
 JWARN Messaging
 JOEF
 SOP
 CONOPS

Resource Status per Mission

Analytical Modeling
 JWARN Correlation
 ATP-45
 ERG
 JEM
 JOEF
 STAFFS
 CHEMRAT
 SAVIOR

Response Plan Per Mission

Analysis and Assessment Per Mission

Structured Messages
 USMTF
 CAP

Human Interaction
 EAR

Electronic
 Sensor Networks
 Warning Networks

Simulation

Simulation

Simulation

Resources of Interest for a Mission
 (Entities)





IIMS Capabilities and Battle Management Issues



Sweep Interface



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

PortWARN Laptop

Map - North America

Settings View Help

SWEEPS

66 ABW NBC 66 ABW SP

M-8 Paper 2005	66 ABW NBC Tea...	66 ABW NBC Tea...	66 ABW NBC Tea...	66 ABW RDR NBC...
M-8 Paper 2005-01-27 1	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	F-000... N P	TEAM DONE
	F-000... N P	F-000... N P	F-000... N P	TEAM DONE
	F-000... N P	F-000... N P	F-000... N P	TEAM DONE
	F-000... N P	F-000... N P	F-000... N P	TEAM DONE

EAR Manager

Settings View Help

New Remove Apply Send Reject Print Track Unplot Complete Export

Drafts Inbox Outbox Open Completed

Event ID	ID #	Event Time	Mode	From	Sent Time
⑧ M8 Bldg(000832)	45	09:31:50 2-16-2005	E	HAFB ...	09:31:50 2-16-2...
⑧ M8 Bldg(000701)	44	09:31:47 2-16-2005	E	HAFB ...	09:31:47 2-16-2...
⑧ M8 Bldg(000989)	43	09:31:43 2-16-2005	E	HAFB ...	09:31:44 2-16-2...
⑧ M8 Bldg(000221)	42	09:31:38 2-16-2005	E	HAFB ...	09:31:38 2-16-2...
⑧ M8 Bldg(000068) A0	41	09:30:58 2-16-2005	E	HAFB ...	09:31:29 2-16-2...

Attack ID: Classification: real exercise Reported By: ABW/NBC Team A

Bld: 000068 Info To: HAFB 66ABW/NBC Reporter's Loc: F-000068

Loc: MGRS By: REILLY:HAFB 66ABW/NBC Reporter's Org:

19TCH1257504995 From: HAFB 66ABW/NBC Reporter's Phn:

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

M8 Recon Site/Pulse Point ID:

M8 Color: Paper Changed?

Gold or Yellow (G-Nerve) Concentration: Heavy Medium Light

Pink or Red (H-Blister)

Green or Blue (V-Nerve)

White (Uncontaminated)

Current Remarks Add Remarks

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

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	Progress	Count
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





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 Detector Networks

W IIMS Digital Dashboard - /C:/IIMS/Dashboard/ddbs/DASHBOARD.ddb

File Edit View Help HANSCOM AFB INFOCON: BRAVO DEFCON: ALPHA THREATCON: BRAVO DUTY : HAFB FEMA 1 RST Leader ONLINE

Map Sweeps Critical Infrastructures Situation Report EAR FEMA 1 Counties ERG weather RDR Maps

RDR Tree

- RDR CP
 - RDR USS Constitution
 - OTHER Radio, PORT = Internal 2
 - M22 ACADA, PORT = PORT 1
 - MCAD MCAD, PORT = PORT 2
 - RDR 20105
 - M22 ACADA, PORT = PORT 1
 - JCAD JCAD, PORT = PORT 2
 - RDR Coast Guard
 - OTHER Radio, PORT = Internal 2
 - M22 ACADA, PORT = PORT 1
 - RDR 30017
 - OTHER MET, PORT = PORT 1
 - MCAD MCAD, PORT = PORT 2
 - OTHER GPS, PORT = PORT 3
 - OTHER Other, PORT = Unknown
 - RDR 30018
 - OTHER Radio, PORT = Internal 2
 - M22 ACADA, PORT = PORT 1
 - MCAD MCAD, PORT = PORT 2

Alerter

Message	Time
RDR 20105 alarming.	2004-06-21 16:32:...
RDR 20113 alarming.	2004-06-21 16:33:...
RDR 20100 alarming.	2004-06-21 16:32:...

Acknowledge...

EAR Manager

Settings View Help

New Remove Apply Send Reject Print Track Tag Complete Export

Drafts Inbox Outbox Open Completed

Event ID	ID #	Event Time	Mode	Owner	Sent Time	Attack	From
BOMB THREAT LatLon(38.975...	928	14:34:29 6-21-...	R	DISA ...	14:36:45 6-21-...		DISA
UXO LatLon(29.47554, -95.03...	959	17:39:58 6-21-...	E	NC II...	17:43:49 6-21-...		NC II
UXO Bldg(001111) A0	942	15:18:16 6-21-...	R	NSW...	15:44:01 6-21-...		DISA
UXO LatLon(38.352077, -77.0...	927	14:31:33 6-21-...	E	NSW...	14:40:54 6-21-...		DISA

Map - Downtown Boston

Travel Restrictions Asset Status IIMS Admin Tactical Rpt CBRN Incident Rpt ALL CLEAR MISC Show EAR Toolbar

- SHIP
- CS DAMAGE
- FACILITY DAMAGE
- SPALL
- CRATER
- VEHICLE PROBLEM
- VEHICLE
- TEAM
- AIRCRAFT

Lat, Lon (42.44803, -71.23982) MGRS (19TCH1580601952) Crash Grid (43.040, C.314)

Info:





CBRN Messaging

PortWARN Digital Dashboard - /C:/WARN/Dashboard/ddbs/IWARN_DASHBOARD_1280x800.ddb

File Edit View Help

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

IWARN Laptop

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 Plot... NBC-3 EDR Validate Correlate CMPStatus Preferences...

Type	Originator	Message Creation Time	Classification
BIOCHEM1 - CHEM	IIMS	2514272AUG2005	Unclassified
BIOCHEM1 - CHEM	IIMS	2517322AUG2005	Unclassified
BIOCHEM1 - CHEM	IIMS	2518582OCT2005	Unclassified
BIOCHEM1 - CHEM	IIMS	2521182OCT2005	Unclassified
BIOCHEM1 - CHEM	IIMS	2521332OCT2005	Unclassified
BIOCHEM1 - CHEM	IIMS	2521432OCT2005	Unclassified
BIOCHEM1 - CHEM	IIMS	2521532OCT2005	Unclassified

Report View | Annotation

```

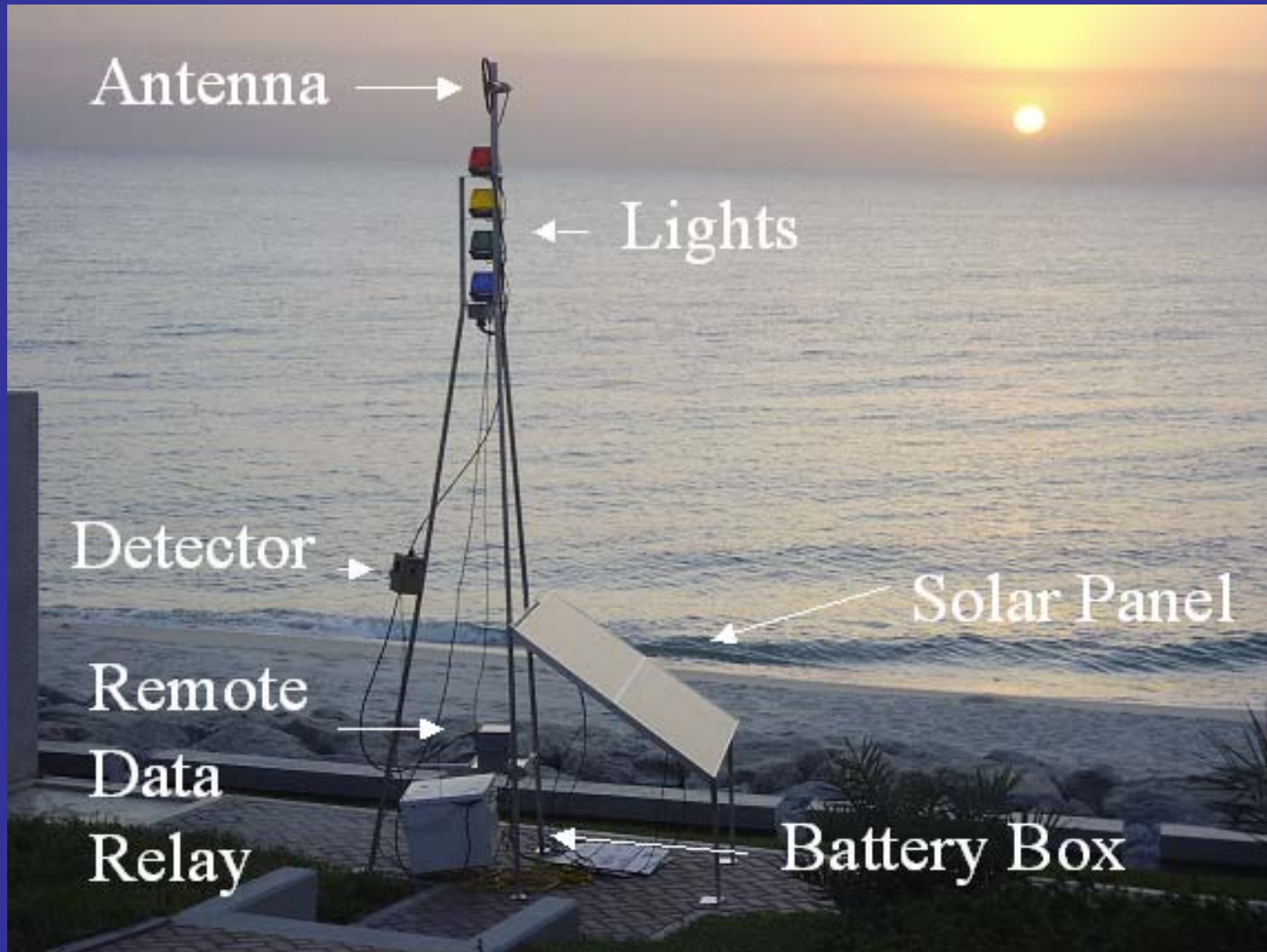
EXER/CWID 2005//
MSGID/BIOCHEM1/IIMS/-/-/-//
REF/A/MSG/L.MILLSK/2914262AUG2005/-/-//
GEO DATUM/WE//
DTG/2914272AUG2005//
ORIGDDPT/NONE/CMD/US/TWG/NBC/SEC/HQSPT/NONE/J/USJ0034//
NBCEVENT/CHEM/-//
ALFA/-/-/-/-//
BRAVO/-/-//
DELTA/ATT:2914262AUG2005/-//
FOXTROT/382118N0770055W/EE//
GOLF/OBS/AIR/1/-/-//
INDIA/UNK/TA:EL0D/UNK//
TANGO/-/-//
GEMTEXT/NBC INFO/-//

```



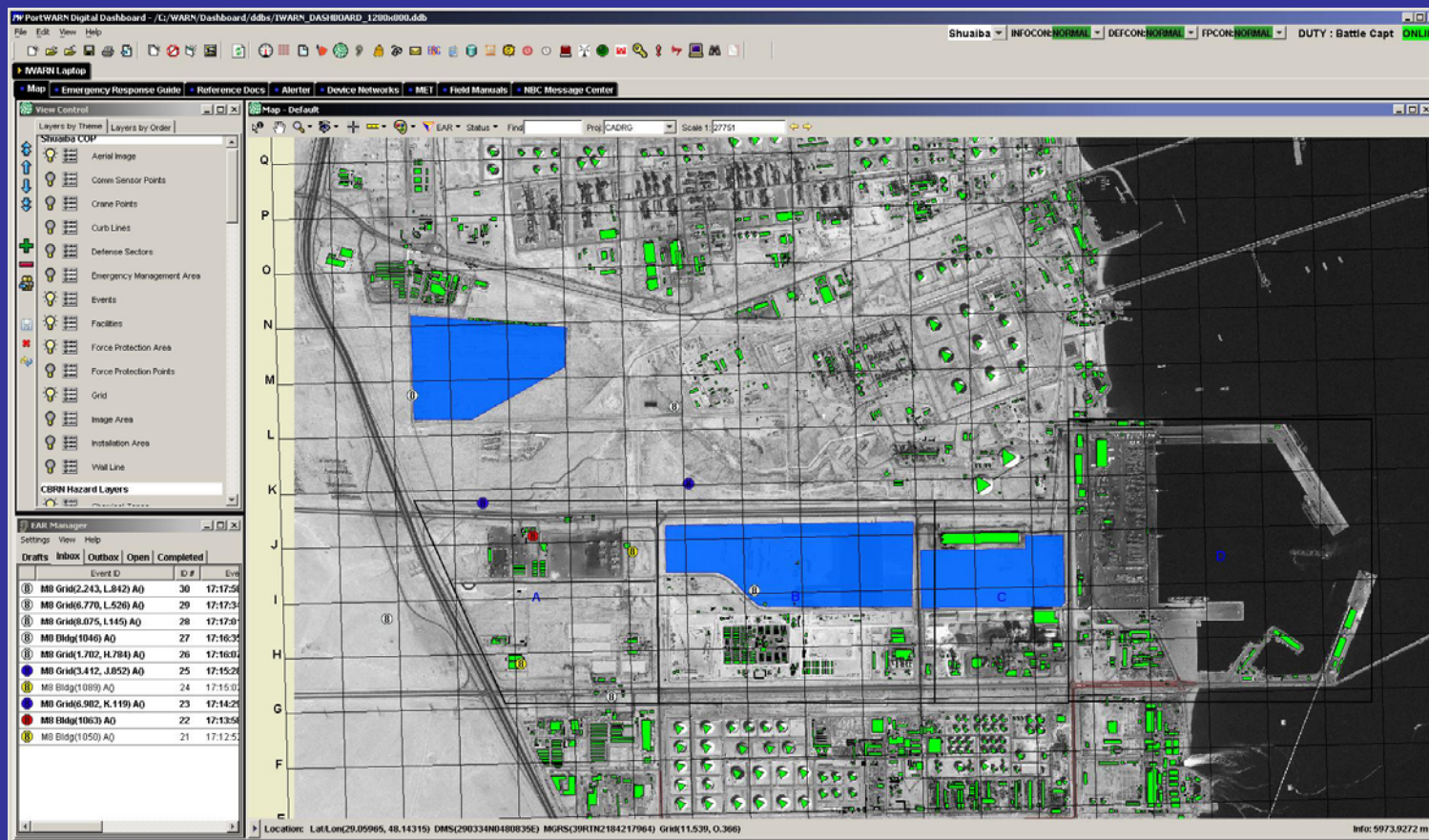


CBRN Warning Networks





M8 Detection



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





Chem Region Drawn by SME

PortWARN Digital Dashboard - /C:/WARN/Dashboard/dbs/1WARN_DASHBOARD_1280x800.jdb

Shualba INFOCON: NORMAL DEFCON: NORMAL FPCON: NORMAL DUTY: Battle Capt ONLINE

Map - Default

View Control

Layers by Theme Layers by Order

- Aerial Image
- Comm Sensor Points
- Crane Points
- Curb Lines
- Defense Sectors
- Emergency Management Area
- Events
- Facilities
- Force Protection Area
- Force Protection Points
- Grid
- Image Area
- Installation Area
- Wall Line

CBRN Hazard Layers

EAR Manager

Settings View Help

Drafts Inbox Outbox Open Completed

Event ID	ID #	Event
		CHEM REGION Grid(2,339, L.7...
⑧	30	MB Grid(2,243, L.842) A0
⑧	29	MB Grid(6,770, L.526) A0
⑧	28	MB Grid(8,075, L.145) A0
⑧	27	MB Bldg(1046) A0
⑧	26	MB Grid(1,702, H.784) A0
⑧	25	MB Grid(3,412, J.852) A0
⑧	24	MB Bldg(1089) A0
⑧	23	MB Grid(6,982, K.119) A0
⑧	22	MB Bldg(1063) A0
⑧	21	MB Bldg(1050) A0

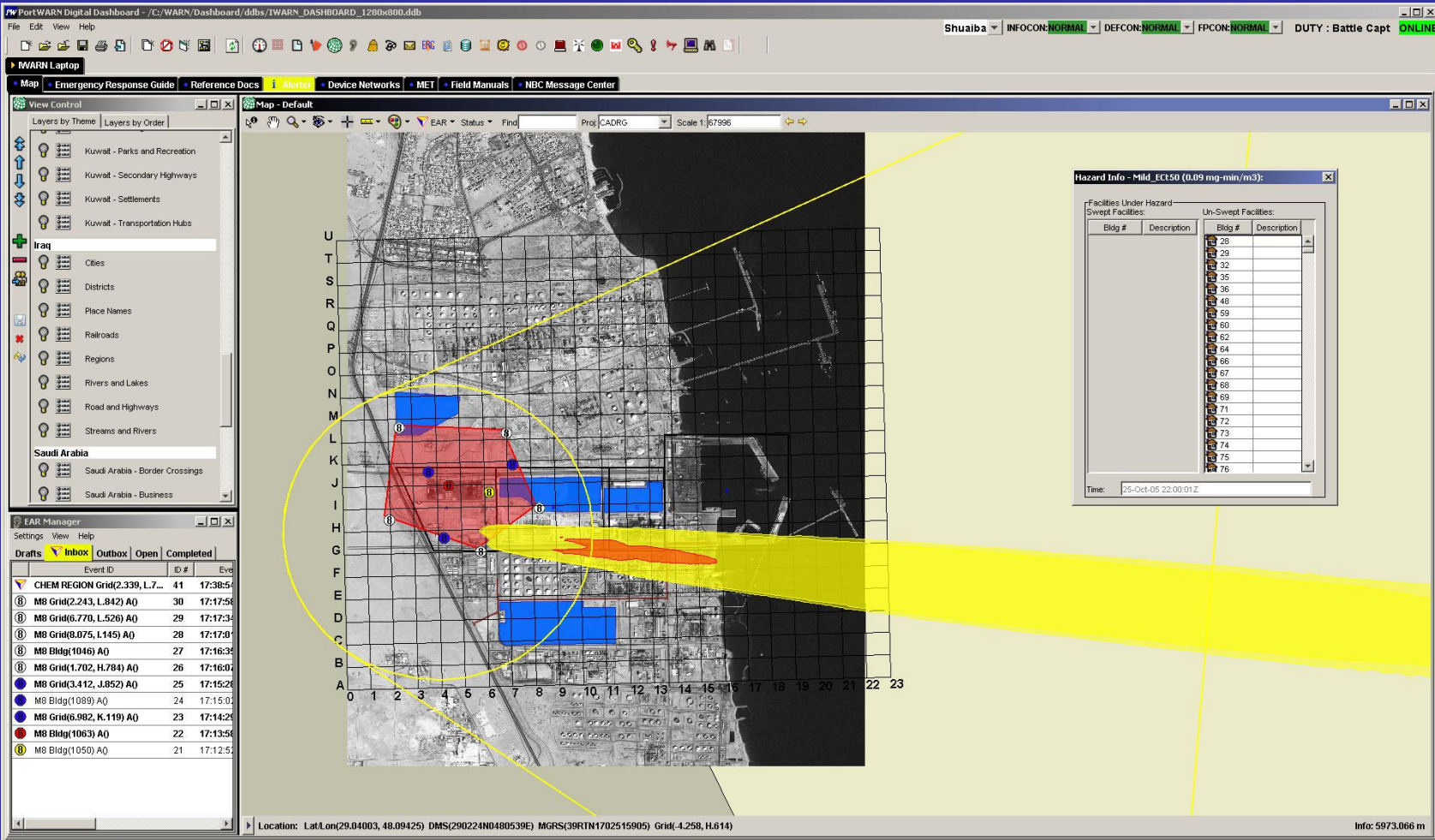
Location: Lat(Lon)(29.04101, 48.12645) DMS(290227N0480735E) MGRS(30RTN2016515937) Grid(6.038, H.719)

Info: 5973.066 m

- SME determines region contaminated at level of detections
 - Manually tag data points to region and resources in it according to SME



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



CBRN Message Content Management

Evacuation Report Generator ✕

? HEADER Remove Propagate

ALFA Remove Propagate

DELTA Remove Propagate

FOXTROT Remove Propagate

GOLF Remove Propagate

INDIA Remove Propagate

PAPAA Remove Propagate

PAPAX Remove Propagate

XRAYB Remove Propagate Propagate Outer Contour

WEATHER Remove Propagate

OK Cancel





CBRN Message Content Management

EXER/-/
 MSGID/BIOCHEM3/-/-/-/-/
 GEODATUM/-/
 DTG/091750ZJAN2007//
 ORGIDDF1/-/-/-/-/-/-/
 NBCEVENT/CHEM/-/
 ALFA/NAT:US/SAMPLE/001/C/-/
 DELTA/ATT:241815ZMAY2004/-/
 FOXTROT/395219N0764543W/AA//
 GOLF/OBS/AIR/1/BOM/5//
 INDIA/SURF/TA:NERV/NP//
 PAPAA/1KM/-/50KM/-/

Full Message

PAPAX/241815ZMAY2004/395148N0764532W/395147N0764539W/395147N0764547W
 /395148N0764554W/395150N0764601W/395152N0764607W/395156N0764613W
 /395200N0764617W/395205N0764621W/395211N0764624W/395216N0764625W
 /395222N0764625W/395227N0764624W/395518N0764524W/395905N0764405W
 /395334N0763656W/395234N0764149W//
 PAPAX/241900ZMAY2004/402016N0765717W/401422N0761401W/395349N0763638W
 /395334N0763656W/395320N0763715W/395257N0763759W/395240N0763847W
 /395229N0763938W/395226N0764031W/395229N0764123W/395234N0764149W
 /395147N0764539W/395147N0764547W/395150N0764601W/395152N0764607W
 /395156N0764613W/395205N0764621W/395211N0764624W/395222N0764625W
 /395518N0764524W//
 XRAYB/50/RAT:0.3MM3/395215N0764553W/395213N0764549W/395213N0764543W
 /395215N0764534W/395215N0764532W/395215N0764531W/395217N0764525W
 /395217N0764524W/395220N0764514W/395221N0764513W/395221N0764511W
 /395223N0764508W/395224N0764505W/395228N0764459W/395233N0764446W
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 /395231N0764556W/395225N0764557W/395219N0764556W//
 XRAYB/50/RAT:0.5MM3/395215N0764553W/395214N0764551W/395213N0764547W
 /395214N0764540W/395215N0764538W/395215N0764537W/395216N0764533W
 /395216N0764530W/395217N0764528W/395220N0764519W/395221N0764516W
 YANKEE/045DGT/14KPH//
 GENTEXT/NBC INFO/-/

EXER/-/
 MSGID/BIOCHEM3/-/-/-/-/
 GEODATUM/-/
 DTG/091750ZJAN2007//
 ORGIDDF1/-/-/-/-/-/-/
 NBCEVENT/CHEM/-/
 ALFA/NAT:US/SAMPLE/001/C/-/
 DELTA/ATT:241815ZMAY2004/-/
 FOXTROT/395219N0764543W/AA//
 GOLF/-/-/-/-/
 INDIA/UNK/-/-/
 PAPAA/1KM/-/50KM/-/

Evacuation Message

PAPAX/241815ZMAY2004/395148N0764532W/395147N0764539W/395147N0764547W
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 /395334N0763656W/395234N0764149W//
 PAPAX/241900ZMAY2004/402016N0765717W/401422N0761401W/395349N0763638W
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 /395325N0764523W/395322N0764527W/395302N0764541W/395255N0764545W
 /395252N0764547W/395244N0764552W/395242N0764552W/395237N0764555W
 /395231N0764556W/395225N0764557W/395219N0764556W//
 YANKEE/045DGT/14KPH//
 GENTEXT/NBC INFO//
 This Report was generated by the Evacuation Report Tool//

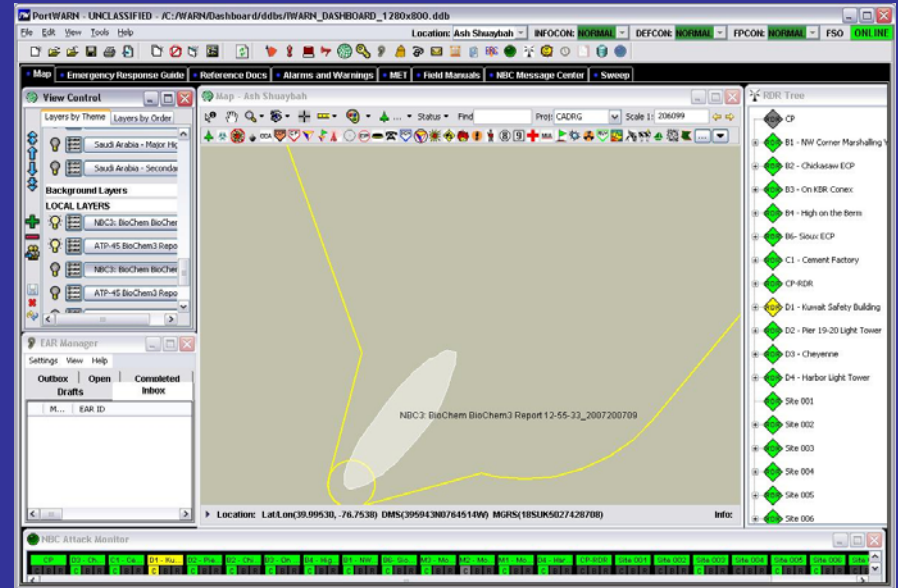
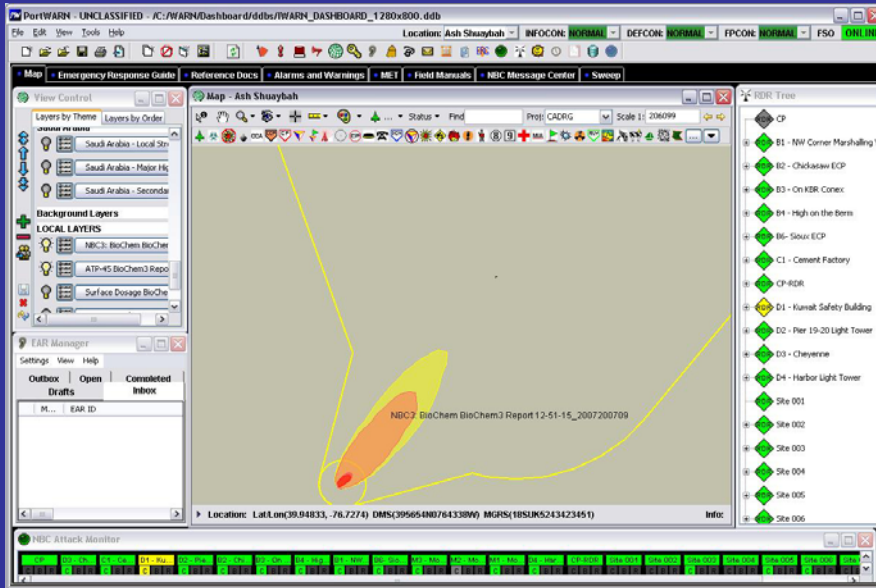




CBRN Message Content Management

Full Message

Evacuation Message





Status Summary and CON Toolbar

W I-WARN Digital Dashboard - JD:/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

Status Manager

LOC ORG ALERT

Expand All Collapse All

Show Status:

THREATCON

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

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			11:46:36 3-21-2005
THREATCON	BRAVO		11:46:36 3-21-2005

Map - Default

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

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	FMC		18:25:38 11-8-2004
MOPP	0		18:25:38 11-8-2004
THREATCON	ALPHA		18:25:38 11-8-2004

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





Sweep Manager and Progress Monitor

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

PortWARN Laptop

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 2005-01-27 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	F-000... N P	F-000... N P	? N P
F-000... N P	F-000... N P	F-000... N P	F-000... N P	F-000... N P	TEAM DONE
F-000... N P	F-000... N P	F-000... N P	F-000... N P	F-000... N P	TEAM DONE
F-000... N P	F-000... N P	F-000... N P	F-000... N P	F-000... N P	TEAM DONE
F-000... N P	F-000... N P	F-000... N P	F-000... N P	F-000... N P	TEAM DONE
F-000... N P	F-000... N P	F-000... N P	F-000... N P	F-000... N P	TEAM DONE
F-000... N P	F-000... N P	F-000... N P	F-000... N P	F-000... N P	TEAM DONE

Map - North America

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	Progress	Count
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

Reporter's Loc: F-000068

Reporter's Org:

Reporter's Ph#:

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

M8

Recon Site/Pulse Point ID:

M8 Color: Paper Changed?

Gold or Yellow (G-Nerve) Heavy

Pink or Red (H-Blister) Medium

Green or Blue (V-Nerve) Light

White (Uncontaminated)

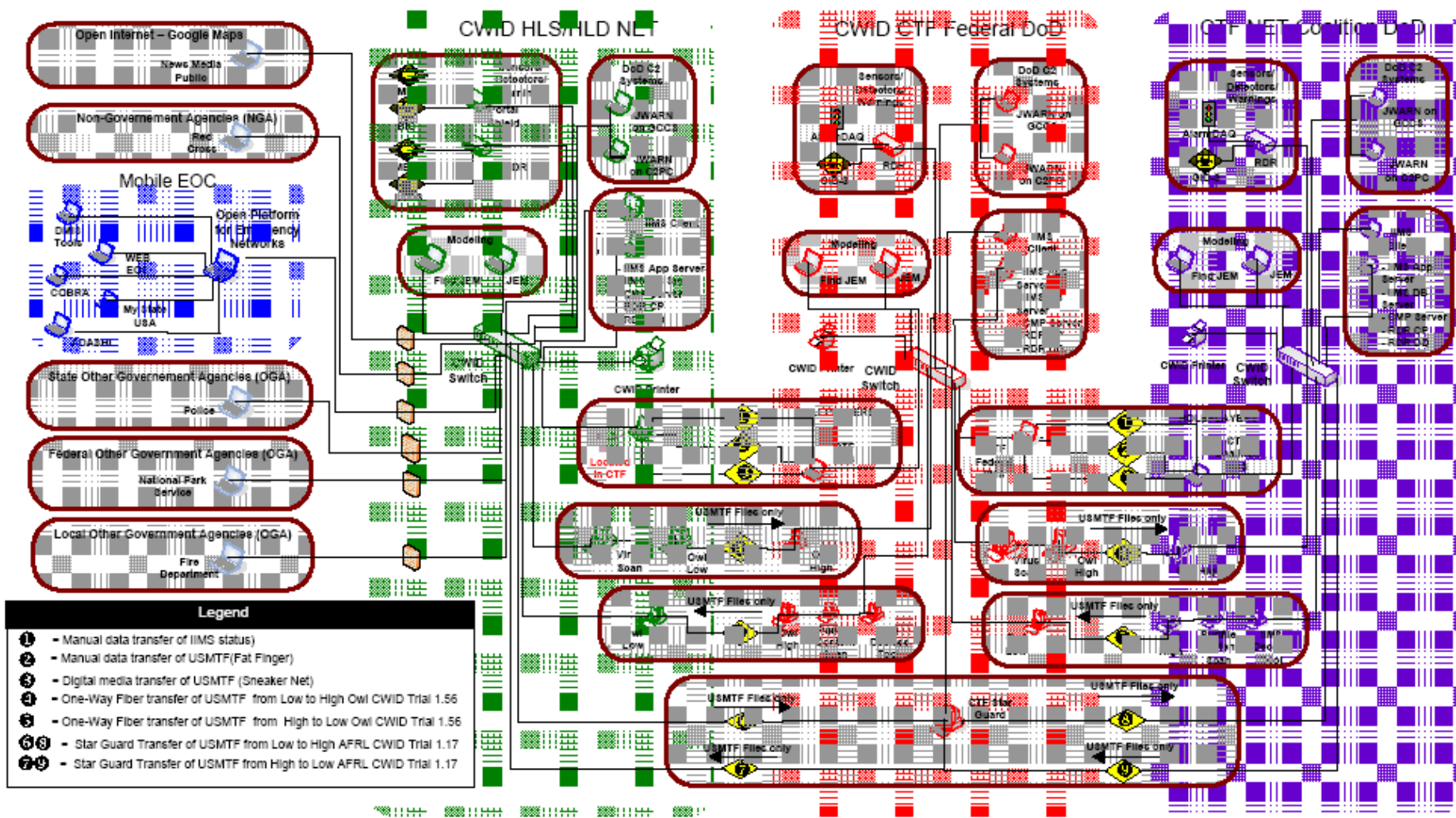
Current Remarks Add Remarks

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





Battle Management Data Flow Diagram





Implementation of the CBRN Data Model





CBRN Data Model

- Evaluated
 - CBRN Messages
 - Detector and Sensor Data
 - In process
- Database Normalization
 - CBRN Report is a hierarchy of groups broken down into fields
 - Table relationships in the data model do not mirror the relationships in the reporting standard
 - Each group in the message maps to multiple tables in the model
 - Each table in the model may handle data from more than one group





CBRN Data Model Recommendation

- It works
- No show stoppers, but too comprehensive for specialized uses
- Use the same data structure at multiple levels
 - Remote Data Relay comm node
 - Remote Data Relay Command Post
 - IIMS Database
- Build lightweight sub schemas for specialized uses
 - CBRN messages
 - Sensor and detector data





Battle Management Requirement for Effective use of Models

- Keep models one layer deep
- Replace predicted results with ground truth or known results at every level





It's not done

- Improved data acquisition and distribution
 - Field observation data
 - Sensor / detector / warning networks
 - Other C2 systems
- Easier integration of analytical models and SME analysis
 - Impact region
 - Operational effects
 - Human effects
 - Confidence
- Easier insertion of response plan and real time response
 - Checklists, sweeps, BSD
 - EAR grouping and information tagging
- GUI to effectively and accurately convey knowledge to the warfighter
- Interoperable Information

