ASA(ALT) Office of Chief System Engineer

Integrated Base Defense

Information Brief to
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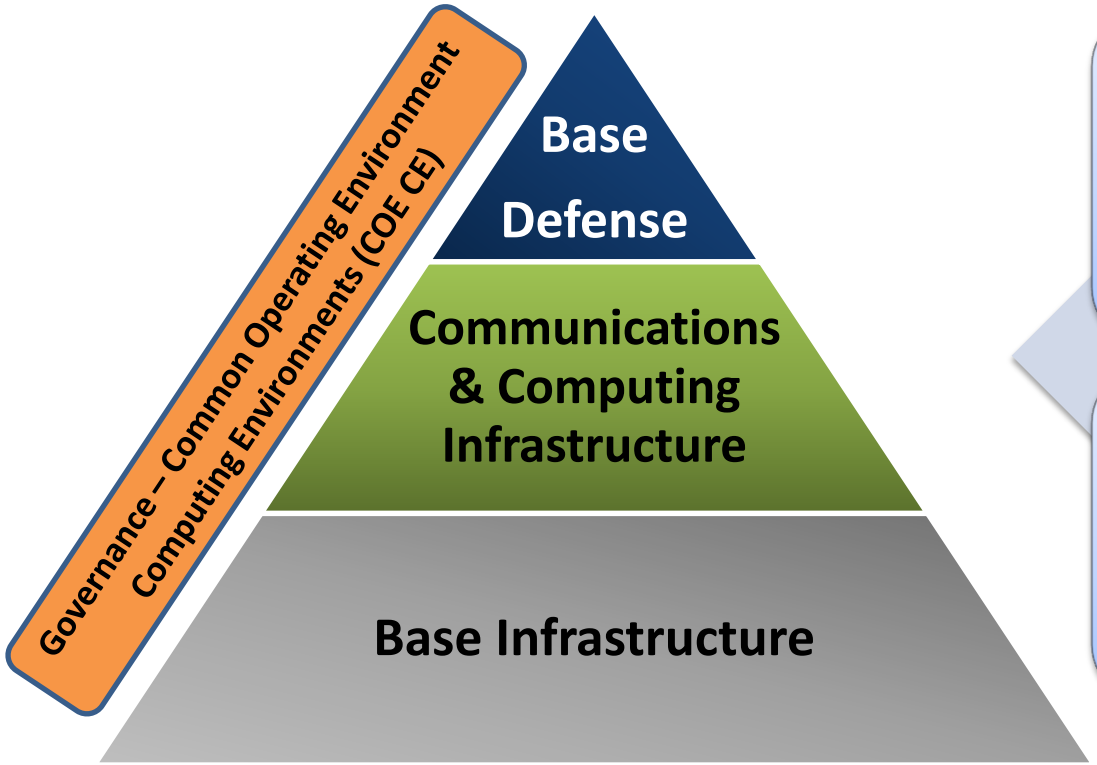
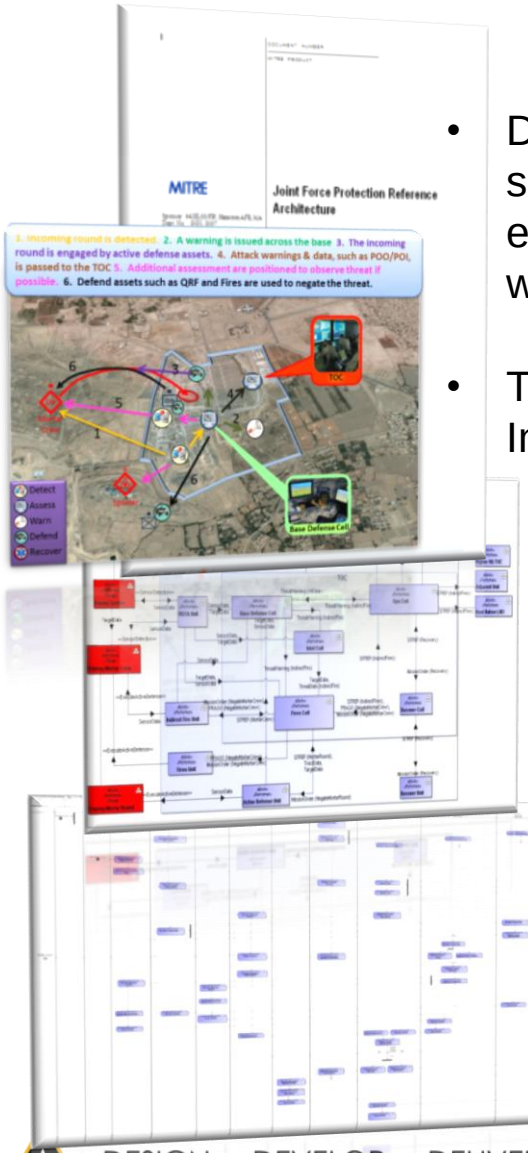
OCSE Architecture & Analysis Team for Force Basing

The AATFB, an Army enterprise-level analysis team of the ASA(ALT) Office of the Chief System Engineer (OCSE), performs in support of the basing of Army and Joint Forces worldwide. Functional areas of ***Integrated Base Defense (IBD), Communications & Computing Infrastructure, and Base Infrastructure***



- Develop Objective Base Architectures for VSO, Mobile, Semi Fixed, Fixed Site, Joint Service, & Coalition Forces
- Support the Integrated Base Defense Governance Forum, CoC and GOSC
- Support the IBD Integrated WSR and FY14-19 POM cycles beginning in FY12 and ending in FY17
- Manage the materiel baselines and supporting architectures for IBD, Comms &Computing & Base Infrastructure

Architectural Foundation

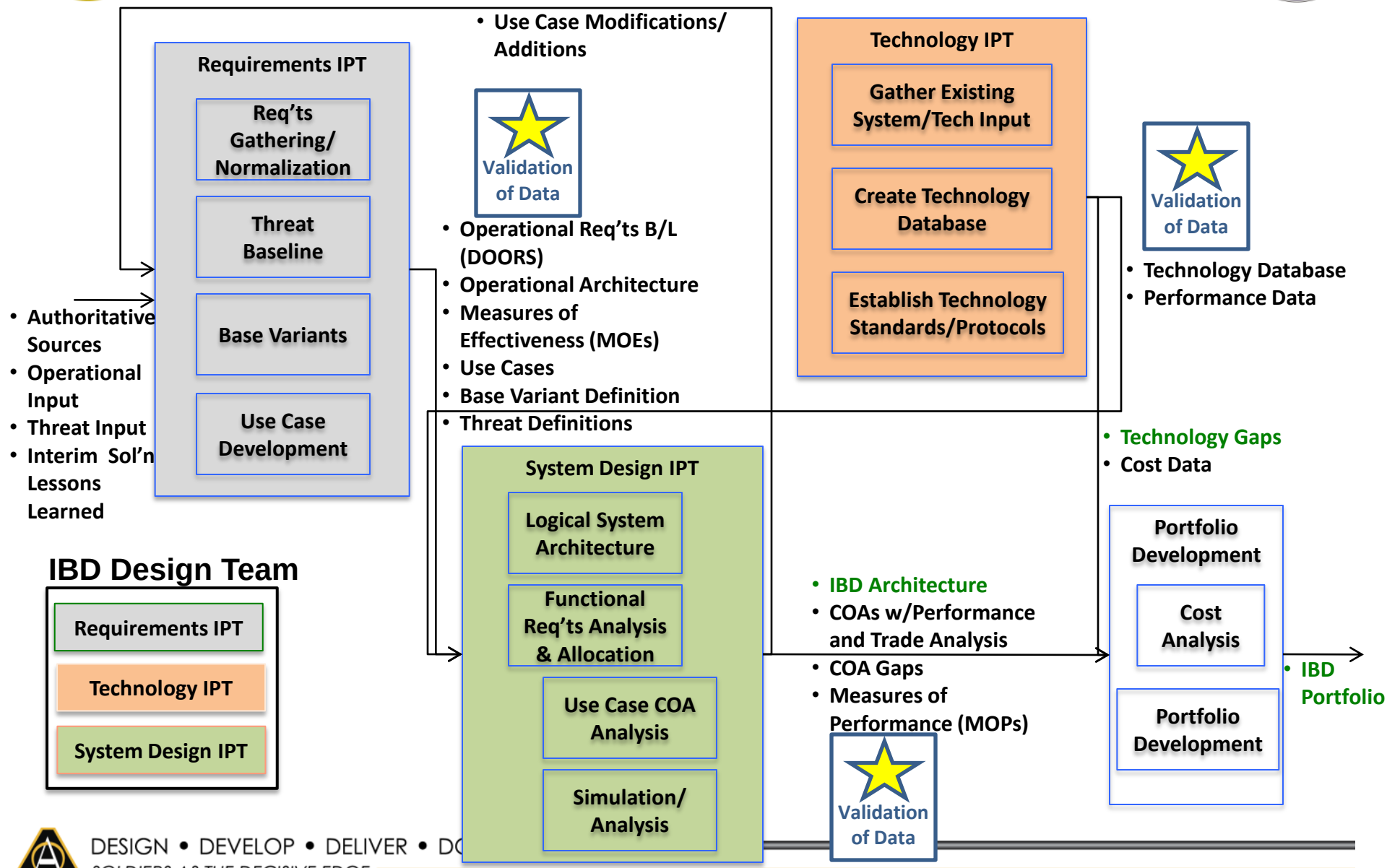


- Design Team sought to reuse existing IBD and related analysis to speed analysis efforts and take advantage of previous efforts. An example is the Joint Force Protection Reference Architecture that was used to support IUBIP analysis.

- The working group generated a series of views of the overall IBD Integrated Architecture to support its work, including:

  - **CV-1:** Vision and Overall Guidance drawn from IUBIP
  - **AV-2:** Defined terms unique to IBD
  - **OV-1:** Graphics for the major base variant types
  - **OV-2:** Graphical and architectural diagrams that defined the organizational structure for each base variant by use case scenario
  - **OV-3:** A list of information exchanges related to IBD
  - **OV-5a:** A list of operational activities related to IBD
  - **OV-5b:** Scenario specific activity diagrams that describe the actions the base operators would take to negate a threat.

IBD Design Process Wiring Diagram



Requirements Analysis

The requirements analysis working group was charged with the following tasks:

- Identify and Manage JIBD Authoritative Sources and Documents
- Synthesize a set of JIBD requirements from requirements sources
- Trace requirements to authoritative sources

Authoritative Sources

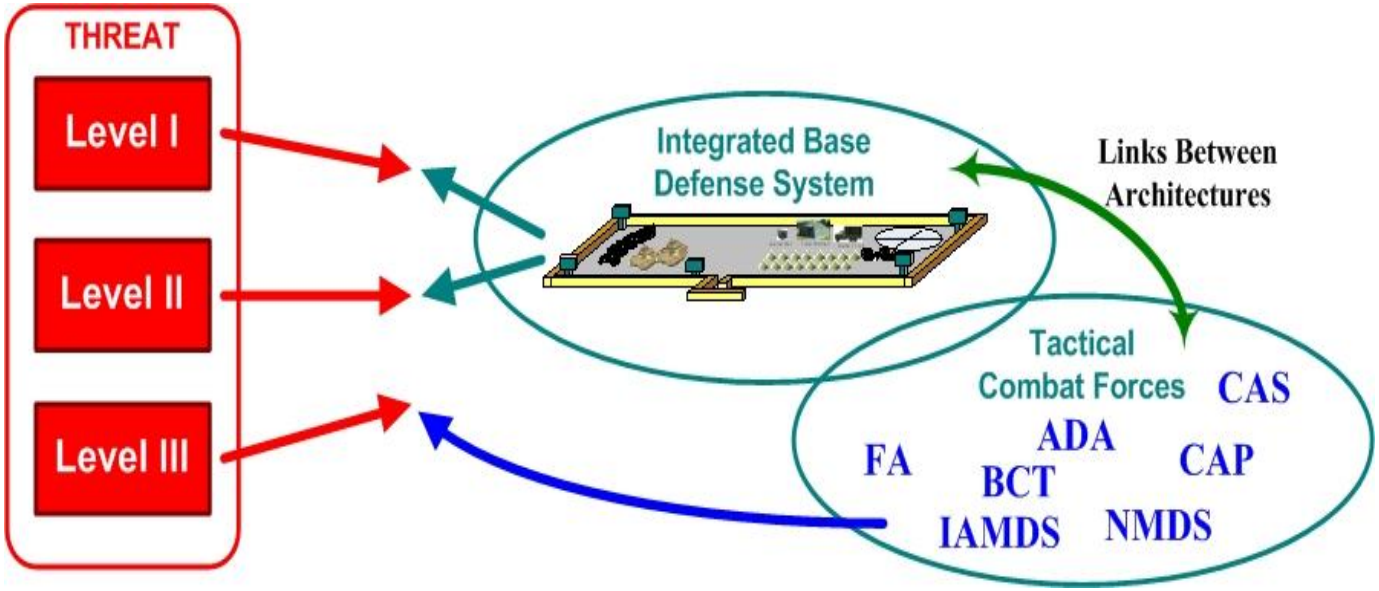
The Design Team is not a requirements generation activity. The working group used authoritative sources to understand required IBD capabilities, existing shortfalls, and operational metrics as a basis for developing a synthesized set of requirements. These sources included, but aren't limited too:

- Protection Joint Functional Concept, JUN 2004
- Protection FAA, JUL 2010
- Protection FNA Draft, DEC 2010
- IUBIP JCD, JUL 2007
- IUBIP FAA, MAY 2007
- IUBIP DAD FSA, May 2008
- IUBIP DAD ICD, Sep 2008
- IUBIP Interoperability Analysis Plan, Feb 2009
- IUBIP AoA, Mar 2010
- IGSSR-C CDD, draft OCT 2010
- GBOSS(E) CDD, draft SEP 10
- TSS CDD draft, APR 11
- IBDSS CDD, FEB 2005
- AR 190-13, Physical Security Program, SEP 1993
- DOD Directive 3224.3, OCT 2007
- FM 3-19.30, Physical Security, JAN 2001
- TRADOC Pam 525-3-5, Functional Concept for Protection, OCT 2010
- TRADOC 525-13, Force Protection Program, SEP 2008
- Unit Antiterrorism Officer Handbook, Sep 2010
- IMCOM Force Protection Operations Order #09-001,

Threat Analysis

- The threat analysis working group compiled and integrated materials from multiple sources in order to create a single threat description that could be used as the threat reference source for the Design Team

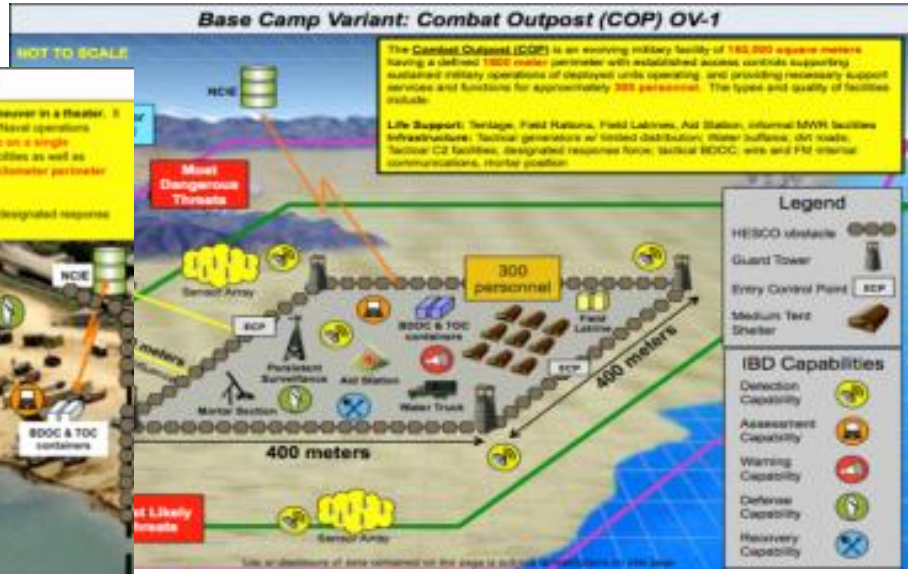
- The working group focused on level I and II threats based on the USAFRICOM threat model, IUBIP threat analysis, and the 2009 Base Defense Priorities Assessment (BDPA). Primary doctrinal sources were: TRADOC Pam 525-3-5 Army Functional Concept for Protection and Joint Publication 3-10 Joint Security Operations in Theater.



Installation and Base Variant Analysis

- The variant working group was tasked with defining a list of common base types across the Joint community based on the IUBIP definitions of fixed, semi-fixed, and mobile base types for both CONUS and OCONUS

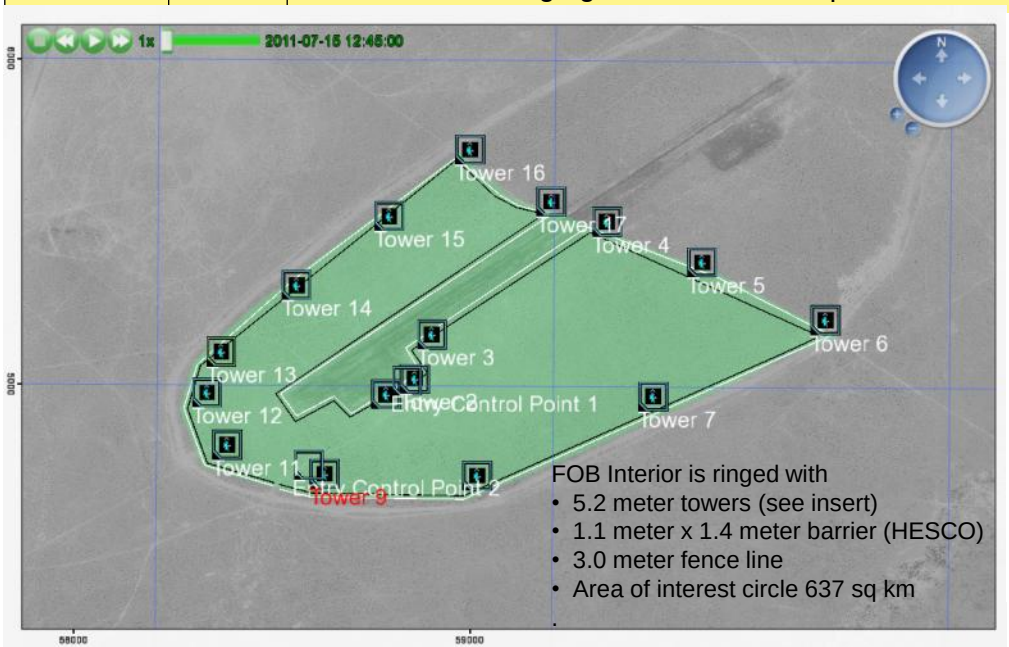
- Additionally, the working group was tasked to define the states and modes an installation/base goes through during its lifecycle, such as operational, non-operational, etc.

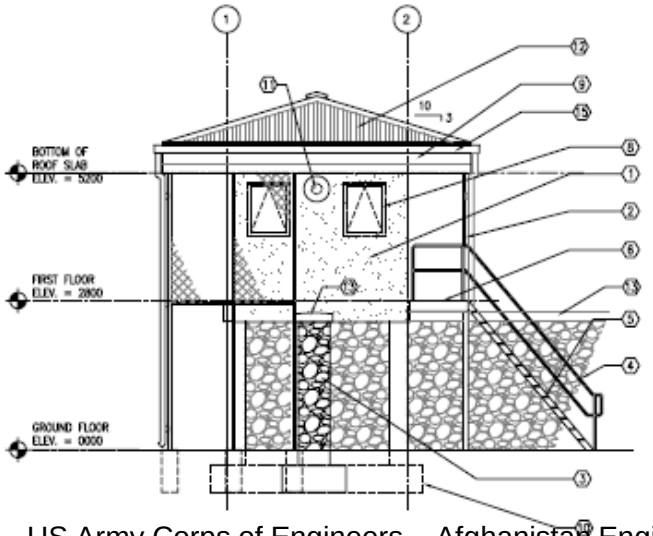


Base Variant Modeling

FOB Variant Definition

Forward Operating Base	FOB	A **Forward Operating Base (FOB)** is a **large** evolving military facility of approximately **1,500,000 square meters** having a defined **5 kilometer** perimeter with established access controls supporting sustained military operations of deployed units operating **from several bases** and providing necessary support services and functions for approximately **2000 personnel.** The types and quality of facilities include: **Life Support:** Containerized housing, field kitchen; showers, contract latrines, field laundry; medical clinic; containerized MWR facilities **Infrastructure:** Large generators or local power w/ distribution; water	Area of influence - 138 km^2 (6km beyond perimeter based on 107mm mortar max range 6,800 meters)	Area of Interest - 500 km^2 (12 km beyond perimeter plus any Heliport Approach Zone)





US Army Corps of Engineers – Afghanistan Engineer District open contract:
Appendix 2-A, Sheet A3

Use Case Foundation

Overarching Scenarios are drawn from the TRADOC GIST and JFCOM Operating Environment Documents

Brigade & Below, Africa IW, 2024

IBD Level 1 and 2 threats are pulled from IUBIP, AFRICOM Threat, and TRADOC PAM 525-3-5

Indirect Fire Threats

Design Team Threat Assessment

IUBIP Capabilities, Shortfalls, Base Types & Metrics

Interoperability

ARCIC/MSCoE Analysis / CONOPS

Design Team Requirements Analysis

Architectural Foundation

Reference Architecture

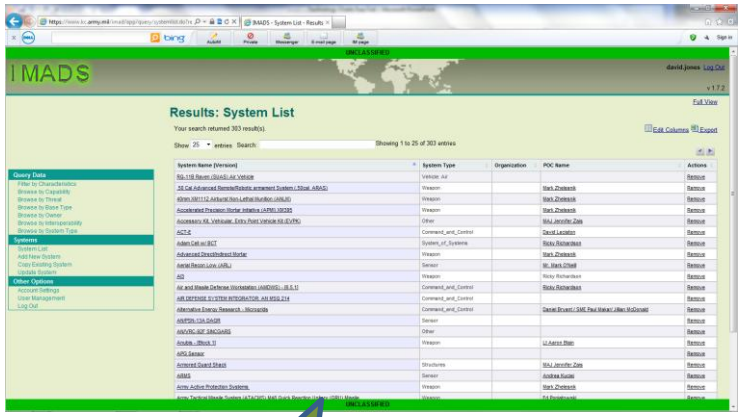
Design Team OV Products

- Validated Operational Scenarios
- Validated Threat
- Validated capability needs, shortfalls, and derived operational requirements
- Validated common tasks, and common Reference Architecture

List of Use Cases to be Assessed

IMADS Development and Use

Integrated Model and Architecture Database System (IMADS) is a relational database containing System Information for existing and emerging technologies. The future development of IMADS will incorporate decision making tools to assist capability gap analysis.



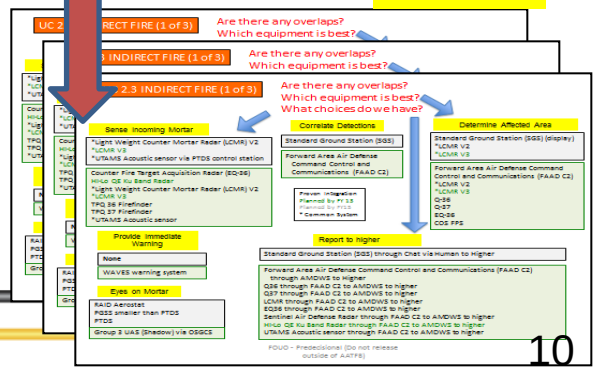
PEO/PMs
Army Tech base

System Name	Accept?	Comment
ACT-E	no	theater intel asset
Air and Missile Defense Workstation (AMDWS)	no	AMD function
AIR DEFENSE SYSTEM INTEGRATOR: AN MSQ 214	no	planning tool
Alternative Energy Research - Microgrids	no	gr
CNET (wireless communications)	no	not fo
CPOF	no	Not for intel data
DSS	no	not application
TCP Control Station and Shelter	no	shelter
S Firestorm	yes	sends threat data/IMADs entry requires update/fix
	no	Not for intel data
	no	air threat data in conjunction with
	no	Not for intel data
	no	Not for intel data
	no	AMD C2 system
	no	AMD C2 system
Integrated Ground Security, Surveillance and Response Capability (IGSSR-C)	no	document not a thing
Joint Tactical Ground Station (JTAGS)	no	Theater level SA system
Joint Tactical Ground Station (JTAGS)	no	Theater level SA system
JTAGS IGC	no	Theater level SA system

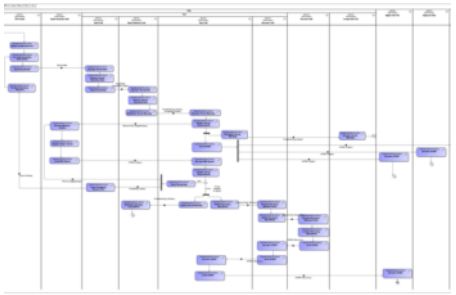
IMADS

Filter per Use Case Function

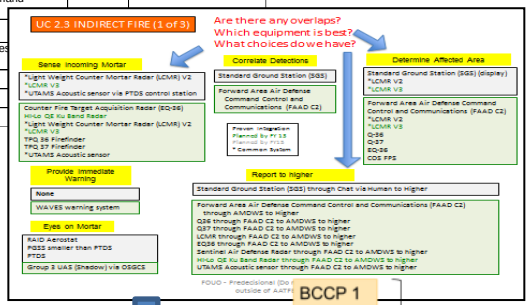
BCCP 1-n

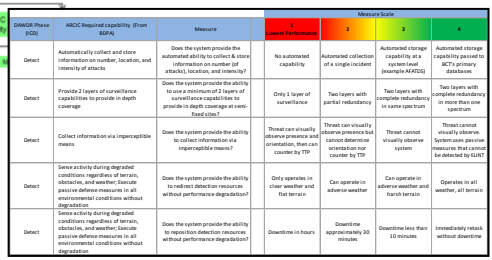


Overall Process

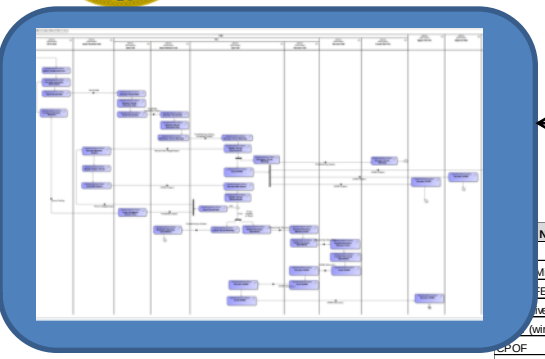


System Name	Accept?	Comment
ACT-E	no	theater intel asset
Air and Missile Defense Workstation (AMDWS)	no	AMD function
AIR DEFENSE SYSTEM INTEGRATOR: AN MSQ 214	no	planning tool
Alternative Energy Research - Microgrids	no	grid management
CNET (wireless communications)	no	not for mobile comms
CPOF	no	Not for intel data
DSS	no	not application
ECP Control Station and Shelter	no	shelter
	yes	sends threat data/IMADs entry requires update/fix
	no	Not for intel data
ir Defense Command Control and s (FAAD C2)	no	air threat data in conjunction with
	no	Not for intel data
	no	Not for intel data
nd Missile Defense Battle Command System (IBCS)		
Integrated Fire Control Station (IFCS)		
Integrated Ground Security, Surveillance and Res Capability (IGSSR-C)		
Joint Tactical Ground Station (JTAGS)		
Joint Tactical Ground Station (JTAGS)		
JTAGS IGC		





Overall Process- Technology Selection



IMADS

Name	Accept?	Comment
	no	theater intel asset
Missile Defense Workstation (AMDWS)	no	AMD function
FENSE SYSTEM INTEGRATOR: AN MSQ 214	no	planning tool
ve Energy Research - Microgrids	no	grid management
(wireless communications)	no	not for mobile comms
CPOF	no	Not for intel data
DSS	no	not application
ECP Control Station and Shelter	no	shelter
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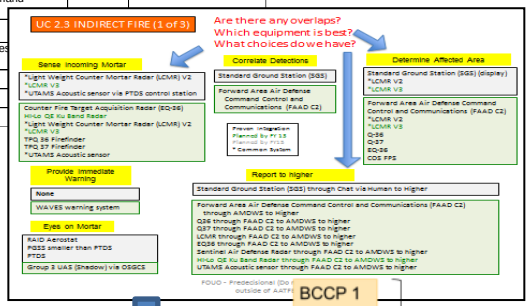
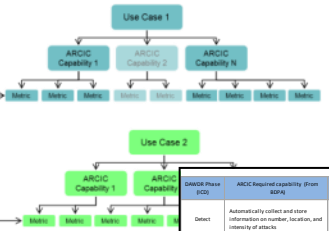
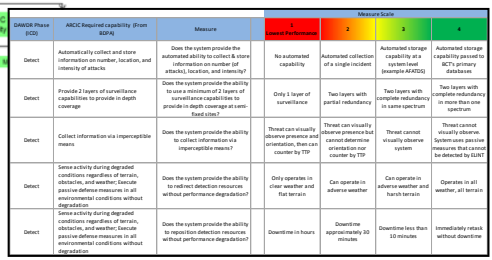
Integrated Fire Control Station (IFCS)		
Integrated Ground Security, Surveillance and Res Capability (IGSSR-C)		
Joint Tactical Ground Station (JTAGS)		
Joint Tactical Ground Station (JTAGS)		
JTAGS IGC		

- Review Use Case OV-2, OV-5, Use Case Steps
- Search IMADS for candidate technologies
- Determine applicability, technology readiness, fielding and funding.
- Document rationale for technologies not selected.



BCCP 1
BCCP 2
BCCP 3
...
BCCP 10





Overall Process- BCCP Development

System Name	Accept?	Comment
ACT-E	no	theater intel asset
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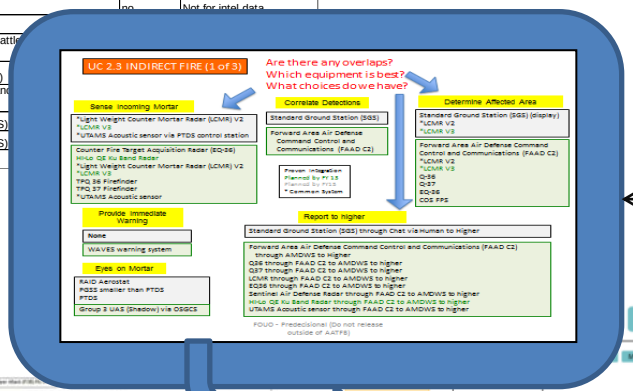
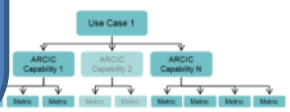
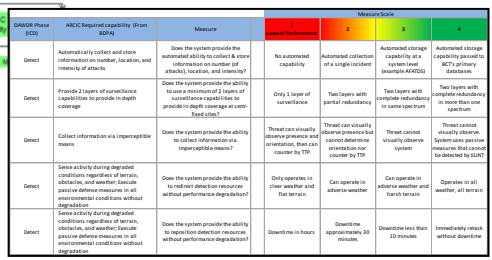
ECP Control Station and Shelter	no	shelter
[illegible]rm	yes	sends threat data/IMADs entry requires update/fix
[illegible]	no	Not for intel data
[illegible]ir Defense Command Control and [illegible]s (FAAD C2)	no	air threat data in conjunction with
[illegible]	no	Not for intel data
[illegible]nd Missile Defense Battle System (IBCS)		
Integrated Fire Control Station (IFCS)		
Integrated Ground Security, Surveillan[illegible] Capability (IGSSR-C)		
Joint Tactical Ground Station (JTAGS)		
Joint Tactical Ground Station (JTAGS)		
JTAGS IGC		

- Determine C4I system options in place by FY'15: SGS/ FAADC2, COSFPS as a stand-alone, SGS/FAADC2 integrated with COSFPS.
- Build BCCPs with technologies that are interoperable with C4I.
- Build into the BCCPs ability to address the four use cases.







Overall Process- Scoring Use Cases

System Name	Accept?	Comment
ACT-E	no	theater intel asset
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[illegible]	no	Not for intel data
[illegible]ir Defense Command Control and [illegible]s (FAAD C2)	no	air threat data in conjunction with
[illegible]	no	Not for intel data
[illegible]	no	Not for intel data
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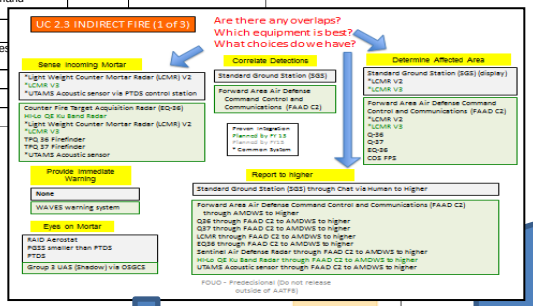
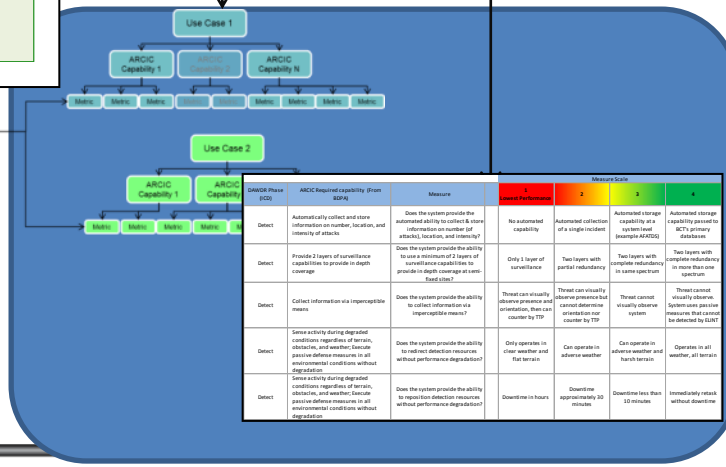
Integrated Fire Control Station (IFCS)		
Integrated Ground Security, Surveillance and Res Capability (IGSSR-C)		
Joint Tactical Ground Station (JTAGS)		
Joint Tactical Ground Station (JTAGS)		
JTAGS IGC		

- Determine weights for Use Cases and ARCIC Capabilities from SME panel, 16-19 Sep.
- Develop scoring criteria (1-4 Scale) for each ARCIC capability per use case.
- SE panel scores BCCPs.
- Use scores to run iterations to revise BCCPs.

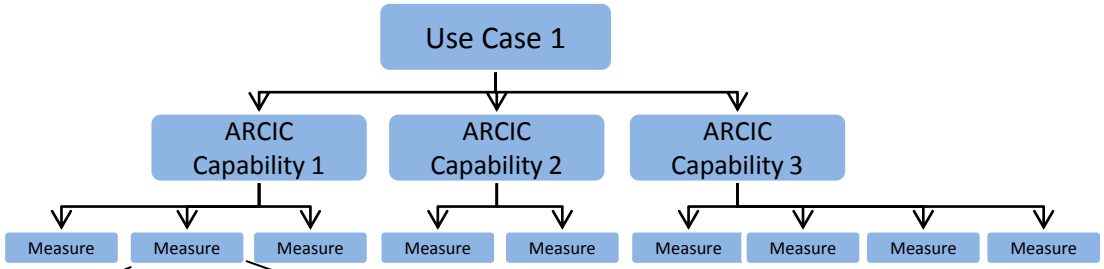


BCCP 2
BCCP 3
...
BCCP 10



BCCP Performance Attribute Assessment

Hierarchy for Use Case 1

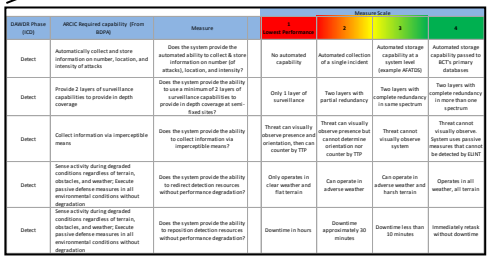


W_i: ARCIC Use Case Weighting

V_{iK}: ARCIC Capability Weighting

X_{ik}: Measure Score for a BCCP

Measure Scales



BCCP 1
BCCP 2
BCCP 3
…
…
BCCP 10

BCCP Scoring

Additive Value Model Calculation

$$\alpha_{BCCP,\,i} = \sum_{k} X_{ik} * V_{ik}$$

BCCP PAA score for Use Case i

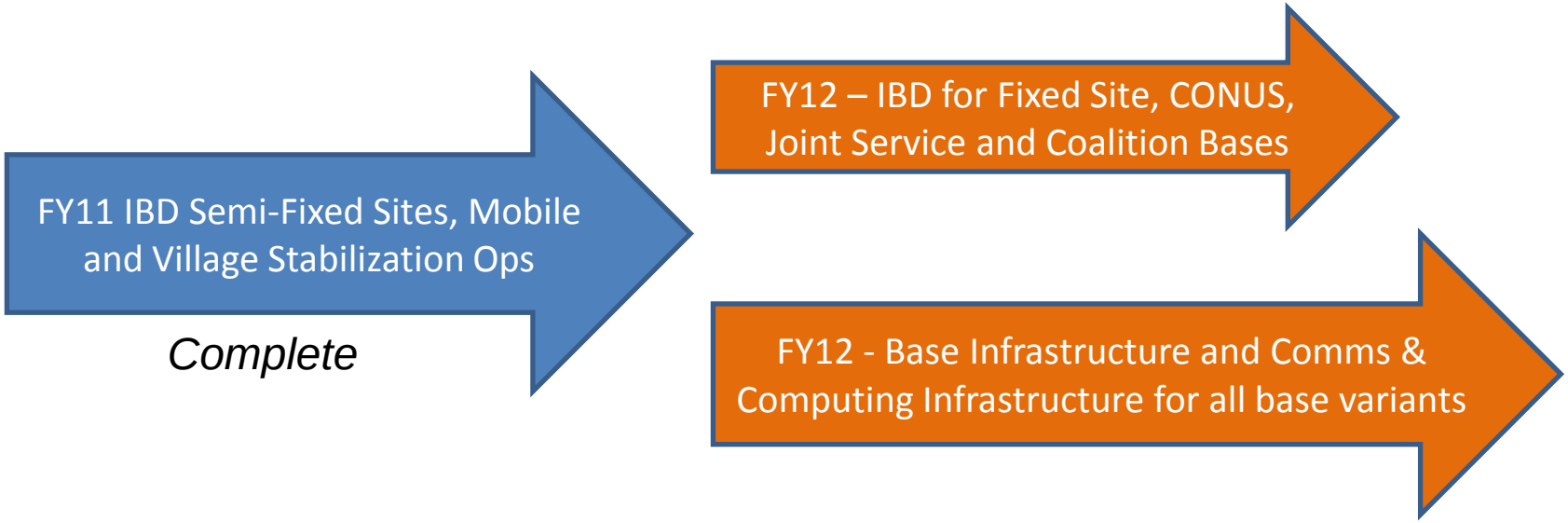
$$\alpha_{BCCP,\,all} = \sum_{i} W_i * \alpha_{BCCP,\,i}$$

BCCP PAA total score across all Use Cases

α_{BCCP}	=> performance for each BCCP
i	=> Use Cases
k	=> Measure for Use Case
W	=> Priority of Use Case
X	=> Score of the BCCP against the measure
V	=> Priority of ARCIC Capability for Use Case

AATFB: FY12+ Actions and Deliverables

- Increase scope beyond FY11 to include fixed site, CONUS, Joint Service and coalition bases
- Develop Objective Architecture for
  - IBD - Fixed Site, Joint Service, Coalition
  - Base Infrastructure
  - Army Enterprise Comms and Computing Infrastructure
- Manage the materiel baselines and supporting architectures



Questions?