OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
1400 DEFENSE PENTAGON
WASHINGTON, DC 20301-1400

PUBLIC AFFAIRS

RR

Ref: 96-F-1598

Mr. Robert Wampler
The National Security Archive
Gelman Library, Suite 701
2130 H Street, NW
Washington, DC 20037

Dear Mr. Wampler:

This responds to your August 8, 1996, Freedom of Information Act (FOIA) request. Your March 19, 1997, conversation with Mr. Langerman of this Directorate, and our August 26, 1996, interim response refer.

The Offices of the Undersecretary of Defense for Acquisition and Technology; Deputy Assistant Secretary of Defense for Strategy and Resources; Deputy Assistant Secretary of Defense for Special Operations and Low Intensity Conflict; and the Director Net Assessment have determined that the enclosed documents are responsive to your request.

Additionally, three other documents were located as a result of the search. One document has been sent to each the Army, Navy, and the Air Force as a matter under their cognizance for their review and direct response to you. The following addresses pertain:

NOT ATTACHED FOR RR COPY

TAB #6 →
Department of the Army
Freedom of Information/Privacy Acts Office
ATTN: SAIS-IA-R/FP, Suite 201
1725 Jefferson Davis Highway
Arlington, VA 22202-4102

TAB #2 →
Department of the Navy
Chief of Naval Operations
N-09B30, Room 5E521
2000 Navy Pentagon
Washington, DC 20350-2000

TAB #5 →
Department of the Air Force
OL-P, 11 CS/SCSR(FOIA)
1000 Air Force Pentagon
Room 4A1088C
Washington, DC 20330-1000

ATTACHED TABS RELEASED →
#1, 3, 4, 7, 8

#856

There are no fees for this response in this instance.

Sincerely,

A. H. Passarella
Director
Freedom of Information
and Security Review

Enclosures:
As stated

10

#856

Revolution in Military Affairs

Low-Intensity Conflict Task Force

Dr. Christopher Lamb

Director, Policy Planning

Mr. Charles Swett

OASD (SO/LIC)

Objective and Scope

- Objective: Provide actionable proposals for potentially revolutionary improvements in U.S. military capabilities for Low-Intensity Conflict
- Scope:
  - Can include combination of:
    - Technological advances
    - Organizational/procedural changes
    - Doctrinal innovation
    - Force structure
  - Grounded in operational requirements
  - Candidate list of 10-15 key areas for Task Force focus
  - Short list of initiatives to recommend to Senior Steering Group
  - Avoid:
    - Proliferation issues
    - Costs and budget offsets
    - Programmatics

Key Challenges for the LIC Task Force

- Definition: Subject matter broad and complex
  - Peacekeeping/Peace-Enforcement
  - "Coup de main" contingency operations
  - Combatting terrorism
  - Counterinsurgency
- Distinguishing LIC from Warfighting requirements
- Identifying critical shortfalls 20 years in the future
- Assessing what constitutes a "revolutionary" increase in LIC capabilities

Distinguishing LIC from Warfighting Requirements

- LIC is not War:
  - Strategic Objective is to alter political relationships, not take terrain and destroy enemy forces.
  - Operational Principles: restraint, perseverance and small unit focus.
  - Critical Priorities (important in war, decisive in LIC):
    - highly discriminate force
    - enhanced force protection
    - information dominance
    - superior small unit capabilities
    - unity of effort: coordinated employment of multiple instruments. Focus is on political-military, interageency and international coordination.

Distinguishing LIC from Warfighting Requirements:

"A patrol is a patrol is a patrol" fallacy

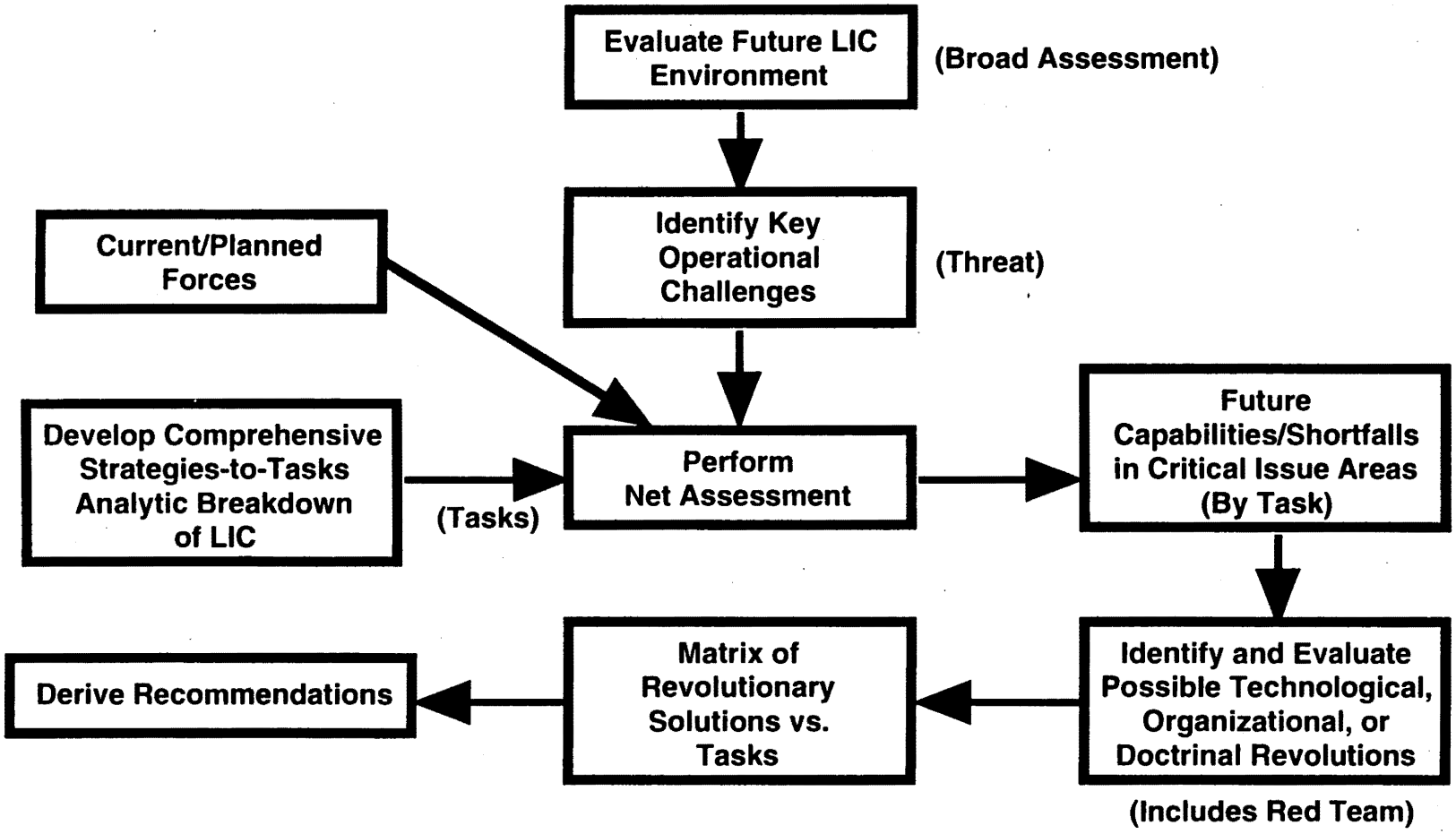
- Combat Recon Patrol in MRC
  - Cover, concealment and camouflage
  - Passive observation
  - Avoid contact
  - Standard combat ROEs
  - Geneva convt/law of land warfare
  - Reconnoiter area
  - Military tactics for self-defense
  - Tactical military chain of command
  - Responsive to CINC's guidance
  - Collateral damage accepted
  - Enemy easily identified
  - If captured, POW
  - *A military operation*

- Urban Recon Patrol in LIC
  - Establish presence/authority
  - Active investigation
  - Interact with civilians
  - Constrained ROEs
  - Intl and local civ/crim law
  - "Police" area
  - Police tactics for self-defense
  - Work with local officials
  - Responsive to Amb guidance
  - Avoid any collateral damage
  - Enemy mixed w/noncombatants
  - If captured, hostage
  - *A political-military operation*

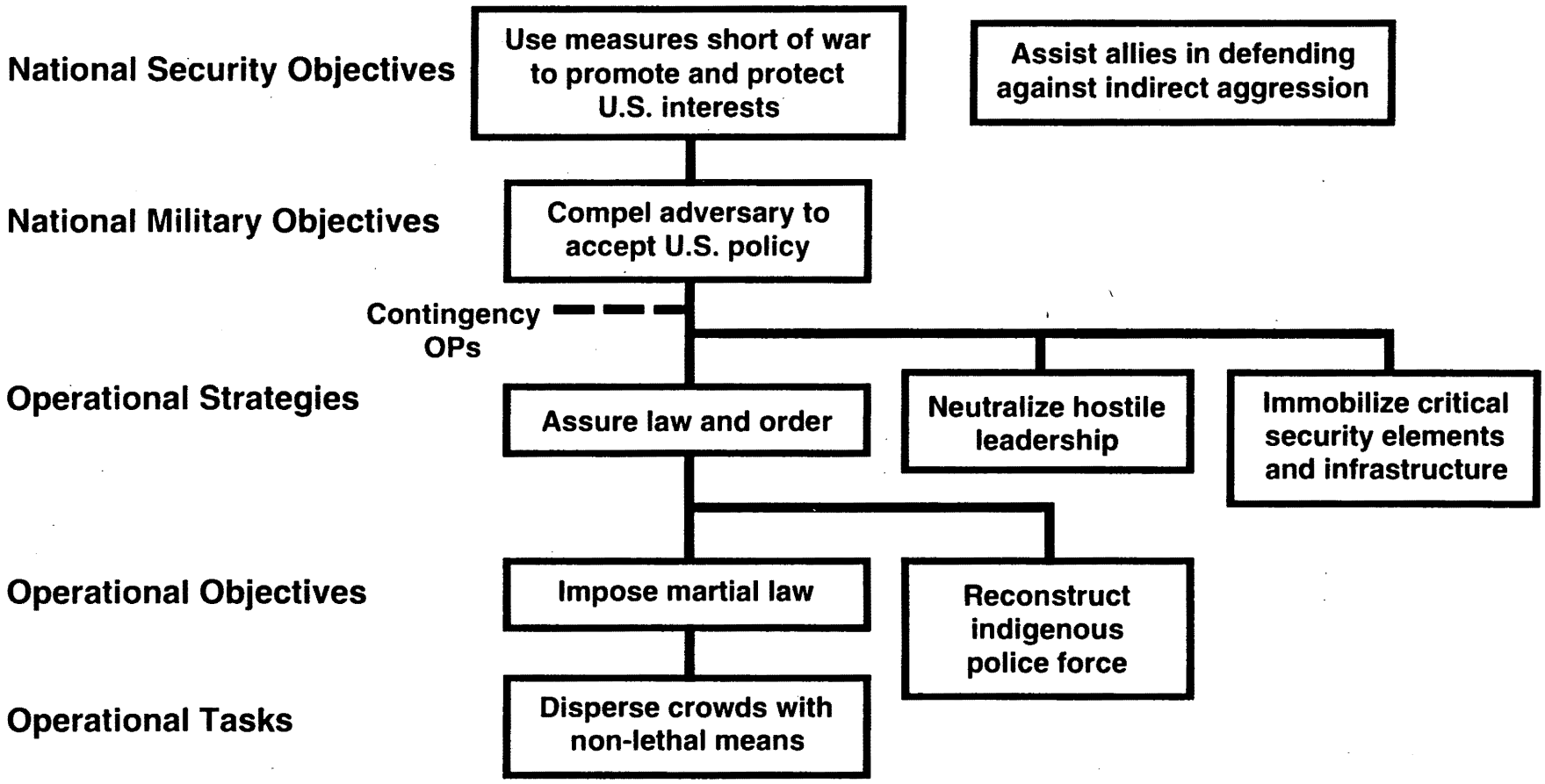
Membership & Organization

- Core group (SO/LIC Chair)
  - SR&R
  - DUSD(P)
  - OSD(A&T)
  - Net Assessment
  - J-5
  - J-7
  - J-8
  - ARPA
  - Army
  - Navy
  - Air Force
  - USMC
- Study groups (layered participation)
- Build on existing efforts
  - ARPA LIC Tech Study
  - Warriors Edge (DDR&E)
  - Army Battle Labs
  - SSI
  - IDA
  - RAND
  - 1992 Hughes Study
  - ITAC, DIA, CIA studies
  - National Labs

LIC Task Force
Overall Methodology



Example Strategies-to-Tasks Breakout



Critical Issue Areas Not Requiring Revolutionary Solutions

- Enhanced small unit capabilities:
  - LIC/situation specific training
  - Command and control
  - Mobility
  - Survivability
- No projected critical shortfalls
- Improving interagency coordination:
  - Adopt common interagency procedures
  - Increase transparency of senior decision making
  - Refine NSC role
- No revolutionary solutions possible or advisable

Relevant Aspects of Future LIC Environment

- Increasing constraints from arms control agreements and policy restrictions
- Increased scrutiny by the world press
- Growing intolerance for casualties
- Proliferation of communication media in the Third World
- Increasing urbanization and large populations of displaced persons
- Greater use of materiel with electronic subsystems
- First-wave adversaries with some Third-wave weapons
- Proliferation of on-line data bases

Impact of Future Environment on Critical Shortfall Areas

Aggravated

Riot control
Neutralize snipers
Control movement of persons/goods
Defeat SAMs
Defeat mobile artillery/mortars
Locate/clear mines
Disrupt public infrastructure

Neutral/ameliorated

Locate caches
Disrupt/secure communications
Communicate into denied areas
Assess civil dimension
Provide warning of terrorist attack
Locate/recover persons/cargo

New tasks/threats?

Directed energy weapons
Non-nuclear EMP weapons
High energy density explosives
Strategic disinformation campaigns

Red Team Results

- No show stoppers
- Political responses
  - Conduct political attack against the system
  - Intermingle combatants with noncombatants
- Military responses
  - Attack the system directly
  - Horizontal escalation

Hovering UAV Battlestation

- Based on "Cypher" or "Peanut" or "Trus" hovering UAV technology
- Reduced optical, thermal, acoustic, radar signatures
- Modular interchangeable payloads
  - Intelligence/reconnaissance/surveillance
  - Offensive (lethal and non-lethal)
- Missions supported (with appropriate payloads)
  - Neutralize snipers, mortars, artillery, shoulder-fired SAMs
  - Crowd control
  - Locate and clear minefields
  - Destroy ammunition/weapons caches
  - Hostage rescue
  - Communicate into distant, denied area
- Especially useful in urban terrain

Anti-sniper System

- Being developed using IR&D funding by Lawrence Livermore National Laboratory
- High resolution sensors and data processing to track bullets and mortars in real time
- Project ballistic trajectory backward to accurately locate the sniper
- Machine gun mounted on high-speed, high-acuracy gimbal system automatically returns counterfire
- Counterfire hits sniper less than one second after he pulls the trigger (in full automatic mode)
- Options for non-lethal responses
- Soldier-in-the-loop control available

Other Non-Lethal Weapons

- Infrasound: High power, low frequency acoustic energy that causes temporary incapacitation of personnel
- Malodorous substances: "Stink Bombs" that target group finds repellent
- High power microwaves: Create electromagnetic barrier to movement of personnel by temporary heating of body
- Foams: sticky, aqueous, rigid
- Entanglement nets
- None of these systems covered by Chemical Weapons Convention
- Missions supported
  - Crowd control
  - Neutralize snipers, mortars, artillery, shoulder-fired SAMs
  - Control movement of goods and personnel
  - Disrupt public infrastructure

Microsensor Networks

- Based on Micro ElectroMechanical Systems (MEMS) technology
- Tiny sensors to detect visual, infrared, seismic, acoustic, chemical, radiation signatures
- Millions of units deployed over large area by UAV or other vehicles
- Microsensors too small, too numerous to destroy
- Smart microsensors organize themselves into networks
- Local-area data from many microsensors combined to create large virtual sensor
- Mission supported: Control movement of goods and personnel

Open Source Intelligence

- Establish "Information Broker" to exploit huge volume of foreign civil affairs-related information available on unclassified online data bases and the Internet
  - Transportation, communication, energy, medical infrastructure
  - Civil government organization, personnel
  - Security services
  - Local Culture
- Make information directly available outside existing intelligence channels to civil affairs consumers
- Mission supported: assess civil dimension
- Many other OSD, Joint Staff, and Service missions could be supported

Multimedia Psychological Operations (Psyops) Campaign

- Simultaneous, integrated, interactive employment of multiple media to convey information to targeted area
  - Electronic mail (Can include graphics and video)
  - Fax
  - Amateur radio
  - Cellular phones
  - Television/Radio broadcast
  - Leaflets
- Address target audience from all directions at once
- Mission supported: communicate into distant, denied area

Sensing Through Walls

- 3-D imaging radar can penetrate walls
  - Brick
  - Mortar
  - Stucco
  - Non-reinforced concrete
- Sufficient resolution to locate people in a room and determine which ones are armed
- Can track moving people in real time
- Missions supported: hostage rescue, destroy ammo/weapon cache, control movement of goods & personnel

High Energy Density Materials

- Much greater explosive power per unit mass than conventional explosives
- Technologies
  - Metastable Interstitial Composites (2 X HE)
  - Ballotechnic Materials (2 to 5 X HE)
  - Nuclear Isomers (1,000,000 X HE)
- Missions supported
  - Destroy ammunition/weapon caches
  - Neutralize snipers
  - Applicable across entire range of conventional offensive weapons

Additional Impacts

All proposed revolutionary solutions would affect:

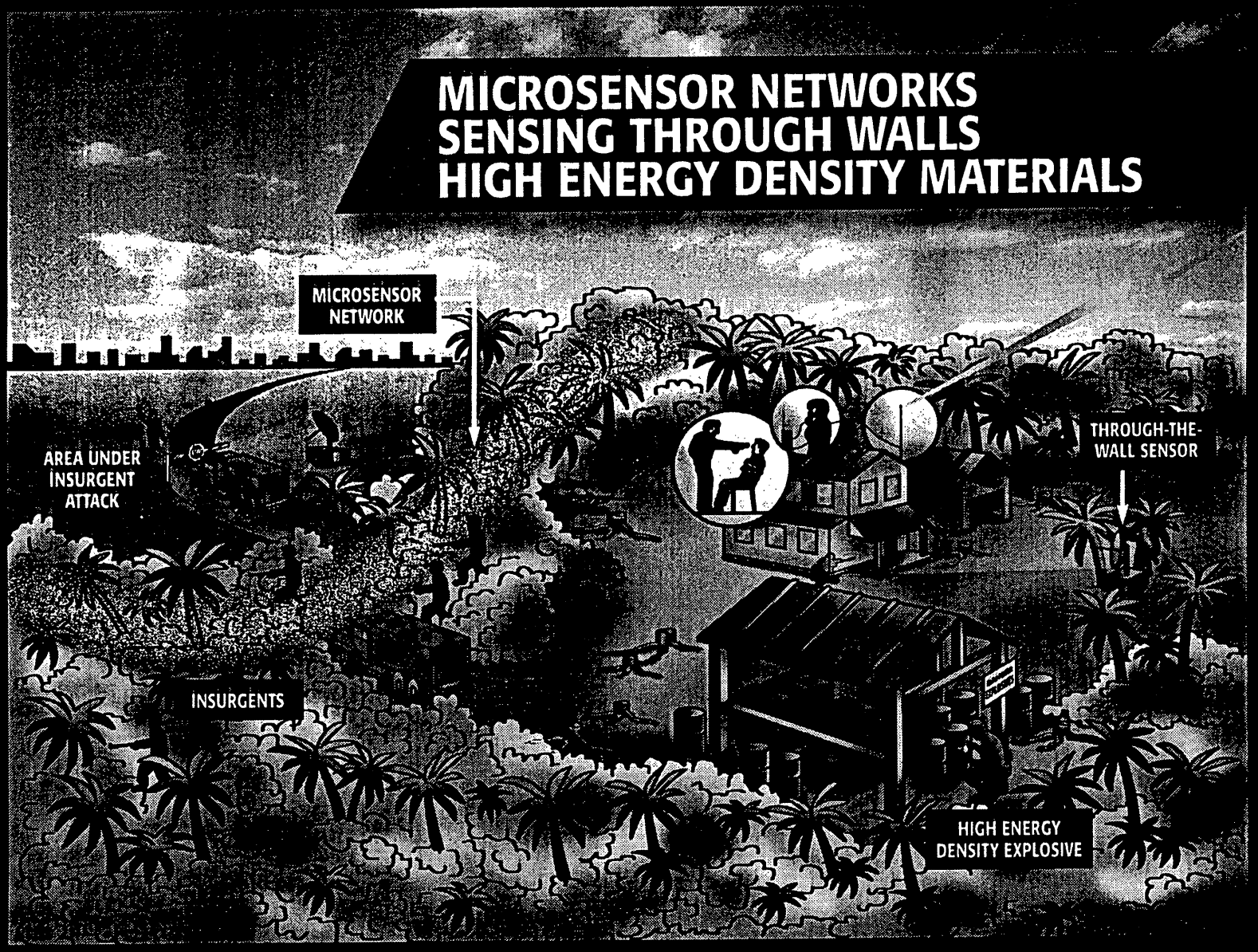
- Manpower
- Training
- Budgets
- Logistics
- Planning
- Programs
- Policy
- Doctrine

Summary Recommendations

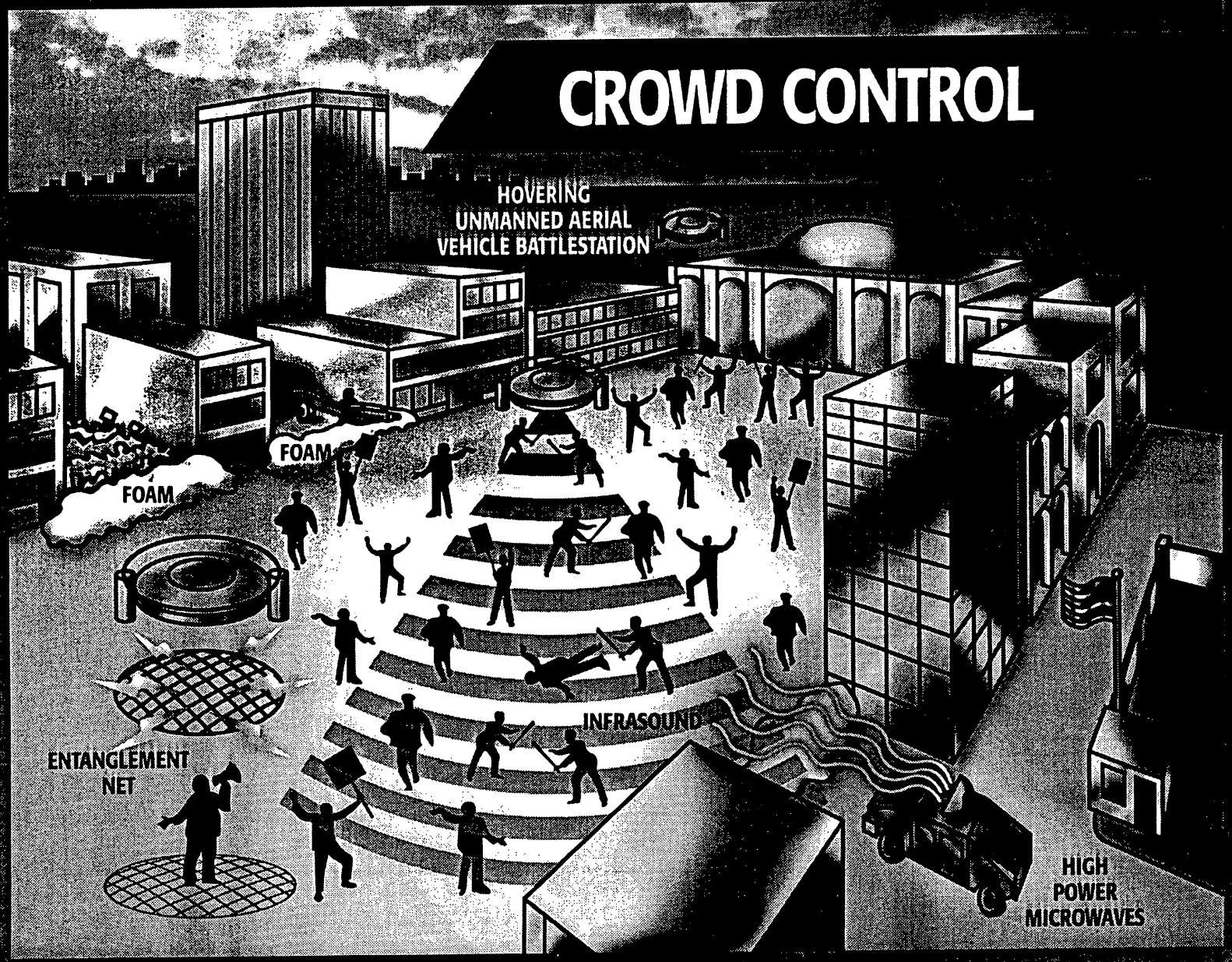
- Option One
  - Integrated approach to developing revolutionary solutions for LIC
  - Concept Development Center proposed by OSD Net Assessment

--or--

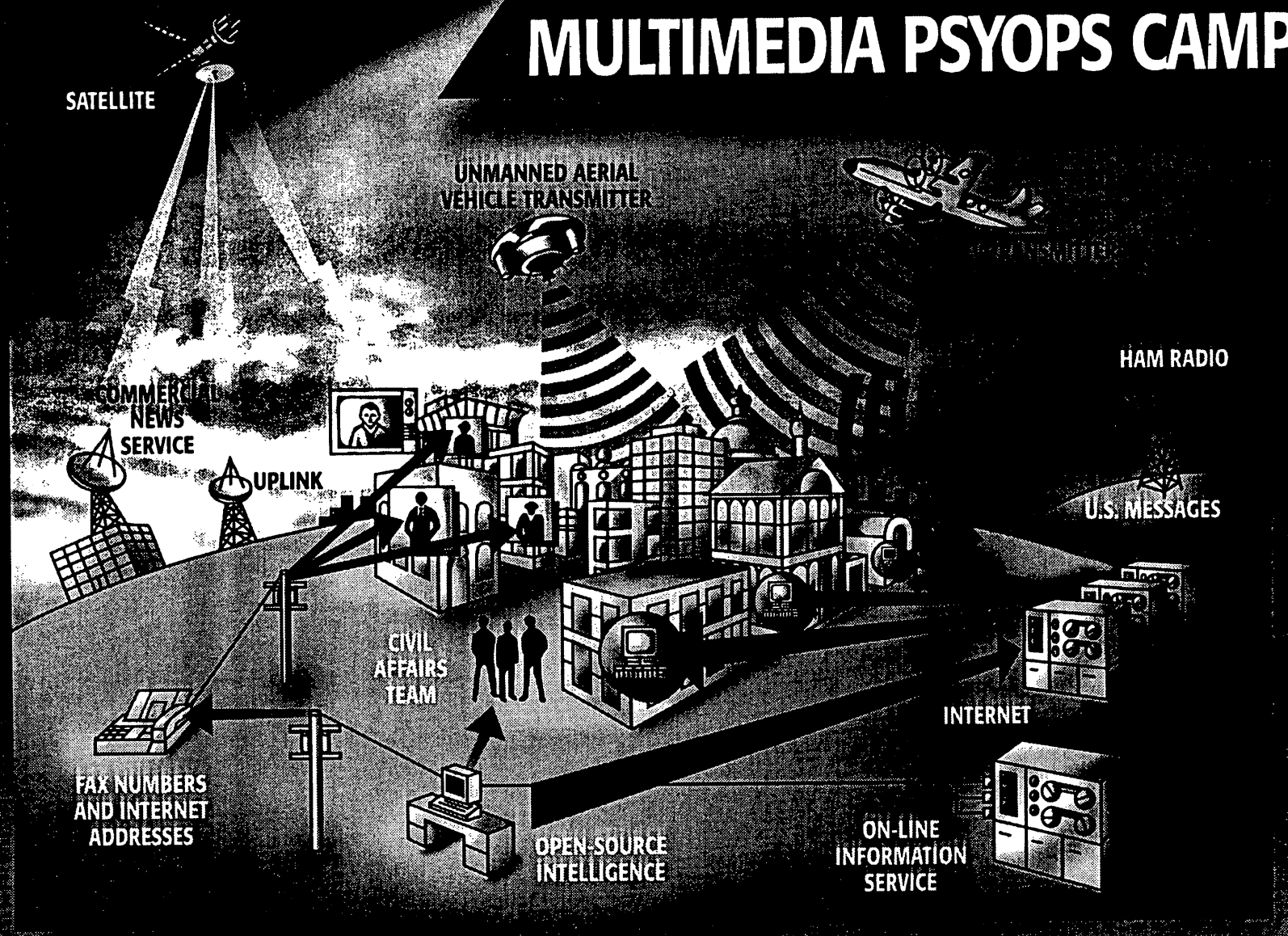
- Option Two
  - Selective approach to developing individual revolutionary solutions
  - Management by existing organizations


MICROSENSOR NETWORKS
SENSING THROUGH WALLS
HIGH ENERGY DENSITY MATERIALS
MICROSENSOR NETWORK
AREA UNDER INSURGENT ATTACK
THROUGH-THE-WALL SENSOR
INSURGENTS
HIGH ENERGY DENSITY EXPLOSIVE

CROWD CONTROL



MULTIMEDIA PSYOPS CAMPAIGN



03

Task Force on Fostering Innovation

Recommendations for the RMA Steering Group

October 1995

Task Force Assumptions

- We are in a special period in military affairs
  - Some militaries will be more successful than others at exploiting new technologies
  - Success will require major, long term change
- Our objective is to lead the intellectual competition
  - We have a major lead now and we need to keep it -- to stay well ahead of our competitors
  - We must be better than our competitors at implementing innovative operational and organizational concepts
  - We must be able to deal with a wide range of threats; from small clever opponents to a future large 'peer' competitor

Task Force Recommendations

- Initiatives being implemented:
  - SecDef Fellows Program
  - SecDef Strategic Studies Group
- Recommendations for near term action
  - Concept Development Center
  - Future threat initiatives
  - Some suggestions for Senior leadership actions
- Areas for further development
  - Promoting innovation through officer education
    - » Curriculum changes at military education institutions
    - » Expanded research activities
    - » Increased gaming and analysis

Concept Development Center

Proposal

- One or two dedicated innovation centers to serve as centerpiece of dedicated efforts to pursue profound innovation in the military
- Empowered to work closely with service and joint organizations responsible for future technology, doctrine, and force structure
- Able to draw upon the most visionary and innovative people for both short and long term projects

Concept Development Center

- Two candidate organizations proposed
  1. Joint Military Organization
     - Primarily military staff
     - Both operational and technical expertise
  2. Civilian-led Organization
     - Think tank similar to Rand in the 1950s
     - Civilian director and mixed civilian-military staff
- RMA Steering Group to act as board of directors, providing guidance and oversight
  - Administrative support from within OSD/JCS

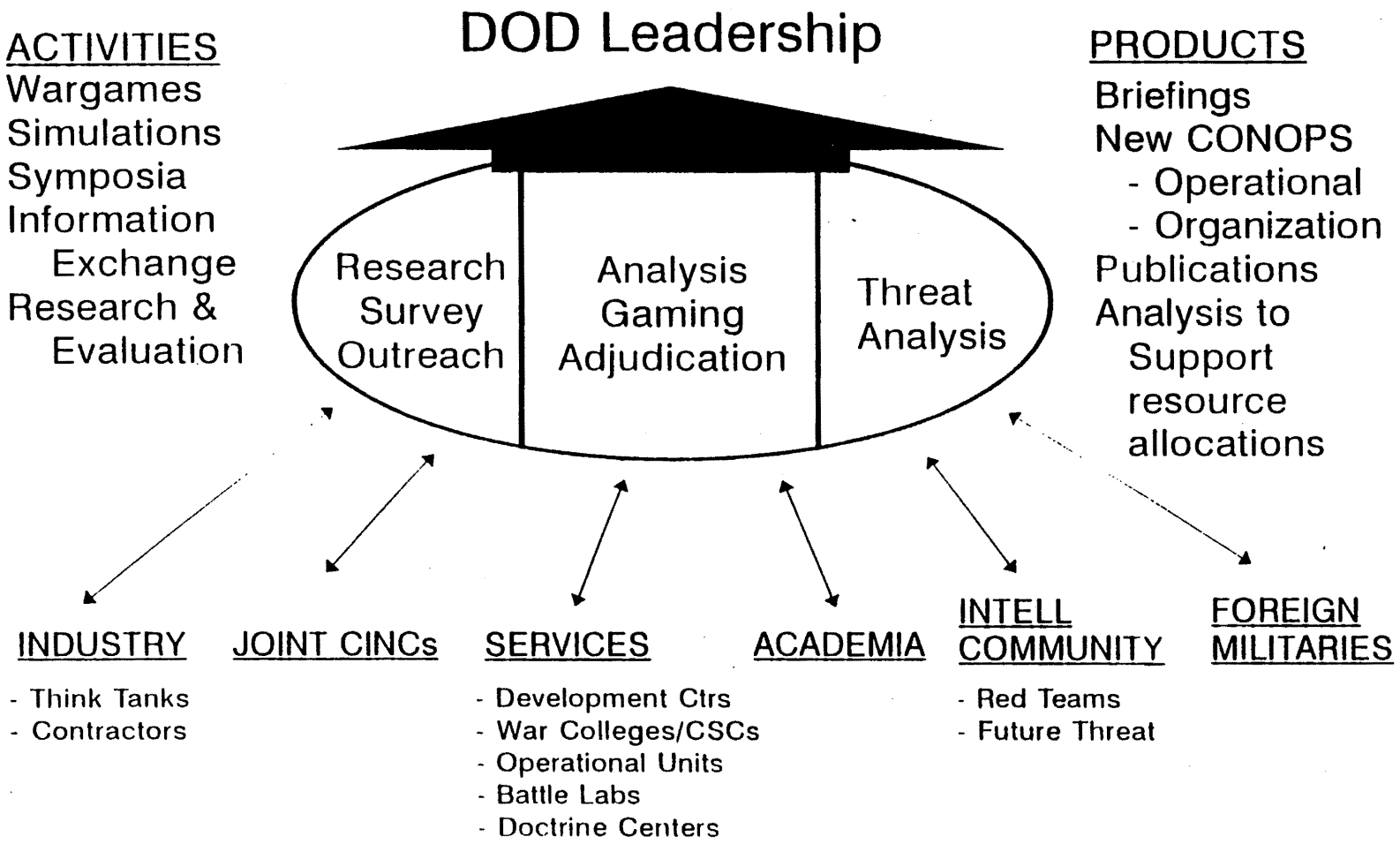
Concept Development Center

Primary activities

- **Actively conduct analysis**
  - Develop new ideas for joint warfighting concepts and organizations
  - Sponsor studies, develop methodologies, conduct war games and simulations
  - Draw upon work in services, industry, academia, and intelligence community
- **Catalyst for innovation**
  - Stimulate activity throughout military and private industry
  - Energize and lead broad program of innovative work

RMA CONCEPT DEVELOPMENT CENTER

Mission: Facilitate Innovative Approaches to Future Joint Warfare



Concept Development Center
Options

- **Joint Military Organization.** Collocated with existing war college or entity like Joint Warfighting Center in Tidewater area.
- **Civilian-led Organization.** Two possible variants:
  - Near a major a major university and active technology center such as Silicon Valley
  - Under aegis of private university such as Stanford or USC.
- Location must attract the very best staff members.
- 10 Year "Sunset Clause" (?)

Concept Development Center

Resources

- **Research Budget:** About $30 million for each center to fund in-house activities and outside research/support
- **Operating Budget:**
  - » About $10 million for joint military organization
  - » About $20 million for civilian organization
- **Investment Budget:** $50 to $100 million to stimulate development of new concepts and ideas for exploiting emerging technologies

Concept Development Center

Implementation

- Appoint implementation coordinator
  - Former senior military with joint experience
  - Likely to have influence with senior OSD/service officials
  - Six month charter
- Develop recommendations as to:
  - » Leadership
  - » Location
  - » Staffing
  - » Resource requirements
- Target activation for Summer of 1996

Supporting Recommendations

- Future Threat Studies Group
  - Senior supervisory group to focus long term analysis on emerging threats
- Red Teams
  - Specialized analytical groups to focus on specific countries and functional areas
- Security Group
  - Dedicated effort to identify specific vulnerabilities in U.S. military operational concepts

Future Threat Studies Group

Requirement: The active search for innovative operational concepts requires a dedicated group to supervise a program of information collection, analyses, and studies of postulated threats and future competitors.

Proposal: A senior steering panel of senior OSD and intelligence leaders with subordinate executive body to coordinate issues and activities

- Located in Washington, DC area under direction of senior OSD official
- Provide overall direction to long range analytical efforts
- Provide direct oversight of Red Teams and Security Group

Future Threat Studies Group

Resources:

- Steering panel membership as a collateral duty
- Small permanent staff with research and travel budget to support Red Teams and Security Group
  - » Annual budget of about $10 million

Implementation:

- Appoint senior implementation coordinator from within OSD
- Six month charter
- Develop recommendations as to leadership, structure, staffing, and resource requirements
- Target activation coincident with CDC

Red Teams

Requirement: A series of highly specialized and focused efforts are needed to fully understand the implications of emerging long term threats from specific countries, new technologies, and emerging warfare areas

Proposal: A dozen or more individual teams made up of perhaps 12-20 experts from diverse areas to focus on military, political, and economic aspects of specific potential competitors and critical warfare concepts

- National and regional teams; e.g. China, Russia, Japan, India, Asia, Europe, Korea
- Functional and warfighting teams; e.g. information warfare, countertargeting, strategic warfare, space warfare, advanced manufacturing, logistics, simulation and modeling.

Red Teams

***Functions*:**

- Conduct multi-disciplinary studies and analyses of ongoing and projected foreign innovations in technology, operational concepts, and organizations
- Postulate foreign RMA developments; analyzing future competition
- Provide opposition play for CDC war games

Resources:

- Teams manned as a collateral duty from intelligence community as well as operational and policymaking organizations
- Support funding from Future Threat Studies Group and CDC

Red Teams

Implementation:

- Organization, direction, projects, and functions determined by Future Threat Studies Group
- Teams should be targeted for activation coincident with the CDC

Security Group

Requirement: U.S. pursuit of new and innovative concepts will potentially open unforeseen vulnerabilities for exploitation by an adversary. Continuing, objective analysis will be required to identify and eliminate such vulnerabilities

Proposal: A team of perhaps 6-12 experts modeled after the SSBN security group. Located in the Washington, DC area, the group will include insightful individuals from both the intelligence and operational communities.

Security Group

Functions:

- Identify specific vulnerabilities in emerging U.S. military operations and organizations
- Propose corrective actions to eliminate these vulnerabilities

Resources:

- Group manned as a collateral duty by select personnel from intelligence and operational organizations
- Support funding from Future Threat Studies Group and CDC

Security Group

Implementation:

- Organization, direction, projects, and functions determined by Future Threat Studies Group
- Group should be targeted for activation coincident with initial analytical efforts by the CDC

Issues for Senior DoD Leadership

Key conclusion: **Senior leadership involvement is critical to the process of innovation**

- Necessary to support and protect innovations and innovators
- More important than in past due to centrality of command and control to emerging innovations in warfare

Senior leadership: **SecDef and other senior officials in DoD, JCS, the services, and the CINCs**

Requirement: **There is need for efforts at senior levels to establish innovative activities and processes**

- Demonstrate organizational commitment
- Devote adequate resources
- Put in place specific programs and activities
- Establish and maintain demand for change

Senior Leadership Actions

Proposals:

- Emphasis in internal DoD and service guidance to focus more long term.
- Planning and programming studies to formally consider and assess the possibility of major changes in warfare
- Speeches and published articles on innovation and RMA
- Incorporation of RMA issues in presentations to Congress
- Attendance at RMA symposia, roundtables, and war games
- Inclusion of RMA threat analysis in long-term intelligence assessments

Area identified for further development

Officer education

Professional military education played a critical role in promoting and sustaining military innovation during the interwar period.

- Specific areas requiring further investigation and development:
  - Role of PME in generating new concepts and in effecting profound innovation
  - Role of military faculties in promoting change
  - Curriculum changes, research activities, gaming and analysis

04

RMA
Concept Development Center

Report of the CDC Working Group

February 1996

RMA CDC Functions

- Sponsor and conduct analysis
  - Focus on the long term implications of emerging technologies
  - Explore new ideas for joint warfighting concepts and organizations
  - Develop and conduct gaming, modeling, and simulation
- Serve as catalyst for innovation
  - Exchange ideas with the network of military and civilian centers exploring new concepts and organizations
  - Interact with joint operational units experimenting in the fleet and field
  - Stimulate a broad program of innovative work in the area of future concepts to exploit available and emerging technologies

CDC History

- 1994-95: Task Force on Fostering Innovation
  - Determined need for institutionalized innovation effort
- Oct 1995 RMA Senior Steering Group Meeting
  - Innovation Task Force recommends creation of dedicated RMA CDC
  - SSG directs concept study
- Oct 1995- Jan 1996: CDC Working Group
  - Investigates CDC options

CDC Working Group Findings

- Validated need for an RMA CDC
  - There is a need for a *joint* organization, focused on the *longer term*, to develop new operational and organizational concepts
  - Will fill a gap in existing service-specific efforts
- A dedicated institution is required
  - The RMA poses unique long term challenges
  - Adding this function to an existing center that does not have a joint, long range focus will dilute the effort and may compromise intellectual independence

Recommendations

1. Establish a dedicated RMA CDC
   - Senior civilian director
   - Reporting to RMA Senior Steering Group (DUSD for A&T and VCJCS)
     - RMA SSG as conduit for CDC findings/ideas
   - Independent senior oversight board
     - Representatives of affiliated institutions
     - Senior outside civilians/retired military
     - Provide oversight of CDC operations

Recommendations

2. Professional staff of about 50
   - 15 Senior civilians
     - Backgrounds in analysis, gaming, info technologies, etc.
   - 30 joint officers
     - Four armed services and broad range of specialties within the services (combat arms, logistics, ops research, etc.)
   - 5 admin support

Military billets:

- 20 three year staff (O-4 to O-6)
- 10 one-year fellows (O-5 to O-6)
  - Facilitate movement of CDC ideas to fleet/field

Recommendations

3. Funding
   - Startup cost: $1 million
     - Staff relocation, space reconfiguration, computers, etc.
   - Annual operation cost: $10 million
     - $4-5 million for operations:
       - Facilities lease and maintenance, civilian staff pay, travel, etc.
     - $4-5 million for contractor support:
       - Studies, analysis, gaming support, etc.

Recommendations

4. 10 year "sunset" provision
   - Keep organization vibrant and innovative
   - Maintain focus on specific RMA issues
   - New organizational approach likely required as RMA theory matures

Evaluating the Options

- Evaluation Criteria
  - Intellectual independence
  - Location
  - Facilities
  - Cost
  - Political Feasibility
  - Timing
- Primary Options
  - Take over existing organization
  - Create a new organization
  - <u>Affiliate with an existing organization</u>
    - Advantages in cost and synergy

Findings

- Rough cost estimates comparable for all options
  - Assumes no new construction
  - All proposals offer admin support structure
  - All proposals offer data networking
- Gaming/simulation facilities
  - RMA expected to require unique capabilities
  - No existing options seem to fill long term CDC needs
  - Contractors and existing M&S resources can be used to develop concepts for new capabilities
  - Data links expected to offer necessary system access regardless of CDC location

Findings

- Most respondents very enthusiastic
  - Strong support for CDC mission
  - Ability to interact with CDC seen as a major benefit
- Primary candidates chosen by working group:
  - NPGS/USC combination
  - NDU
  - FFRDC affiliation
  - JHU/APL

Primary Proposals

- Existing FFRDC
  - IDA (as representative)
- Existing UARC
  - JHU/APL only viable candidate
    - Size, location, diversity
- Existing Service College
  - NDU best candidate
    - Location, jointness
- Private University
  - USC (as representative)
- Naval Postgraduate School
  - Combined proposals with USC
- Existing Joint Command
  - JWFC as best candidate
    - Complementary mission

IDA

- Washington, DC Area
  - DoD leadership
  - Intelligence agencies
  - Complementary military/research organization
  - Proximity to Defense Modeling and Simulation Office
- Facilities
  - Lease commercial space in Alexandria
    - Not collocated with IDA researchers
- Propose an independent center under IDA president
  - Would require an increase in Congressional budget ceiling

JHU/APL

- Washington, DC Area
  - DoD leadership
  - Intelligence agencies
  - Complementary military/research organizations
  - JHU SAIS
- Facilities
  - Probably leased on-site
    - But probably no collocation with complementary activities
  - Access to Naval Warfare Analysis Lab
- Research Association
  - Navy/technology focus

National Defense University

- Washington, DC
  - DoD leadership
  - Intelligence agencies
  - Complementary military/research organizations
- Facilities
  - Access to War Gaming and Analysis Center
  - Space in Ft McNair old commissary or USCG HQ
    - Not collocated with faculty/students
- Academic association
  - NWC, ICAF, INSS
  - Senior joint officers: Ideas and exposure

NPGS/USC

- Monterey, CA
  - Recognized technology center
- Facilities
  - On-campus site
  - Required data links available
  - Support from Ft Ord
- Administration through private university
  - University of Southern California offered as option

Joint Warfighting Center

- Norfolk, VA Area
  - Proximity to joint operational commands/doctrine centers
    - JTASC
    - Prospect of domination by local parochial interests
  - Norfolk area not a recognized academic or technology center
  - Remote from Washington, DC
- Facilities
  - To be determined
- Affiliation with JWFC
  - Expressed need for overarching DoD strategy for long range change

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NPGS/USC Advantages

- Attractive location
  - Near information tech center at Silicon Valley
- Academic affiliation
  - Synergy with civilian faculty/military students
    - Research/ideas and exposure to RMA concepts
    - Broad-based joint student body; technology focus
  - Association with prospective attaches (through DLI)
  - Association with Institute for Joint Warfare Analysis
  - Certified JPME Phase I
- Private university administration
  - Allows competitive salary inducement

Recommended Actions

- Approve or modify the Working Group recommendations
- Select one or more CDC location options for detailed implementation planning
- Designate an implementation director and/or group
- Initiate a process to identify candidates for the position of director

Why a staff of 45?

- Enables 5-7 focused teams of 6-8 different specialists
  - Operators, technologists, analysts, M&S specialists
- Joint focus: All four armed services
  - Broad range of specialties within the services
    - Combat arms, logistics, analysis
  - Varied tour lengths
    - 3 year analysts (20)
      - 1 year to get educated/1.5 years of productive work
    - 1 year senior fellows (10)
- Civilian staff provides team continuity

Why a staff of 45?

- Historic comparisons
  - US Naval War College in the 1920s
    - 44 in average senior class
  - Wozniak/Jobs first Apple lab
    - 50 technical specialists/engineers
- Ongoing Navy SSG innovation effort
  - Four teams of 6-8 persons each
- Lincoln Lab experience
  - Optimum team size of 5-8
  - Broad range of specialties/backgrounds

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LO

Summary Briefing of the RMA Task Forces on Theater Warfare

- SO/LIC
- Combined Arms/Maneuver Warfare
- Maritime Presence/Crisis Response
- Deep Attack
- Organizational Innovation

Report to the RMA Senior Steering Group

April 1995

Objective & Outline

Objective: To identify possible high-payoff areas for enhancing the effectiveness of U.S. military forces, circa 2010-2015.

Outline:

- Approach taken
- Views of future theater warfare
- Generalizations and findings
- The path(s) ahead

The RMA Study Process

Spring-- Seminars on the future security environment
Selected members read into relevant programs

May-- Trends in developing countries' military forces (esp. "high end" competitors, e.g., China, India, Iran)

Summer-- Identify most critical emerging challenges for U.S. military forces

Fall-- Play operational level wargames to:

- Integrate previous material
- Test hypotheses about "Red" and "Blue" strategies
- Assess nascent options for meeting emerging challenges

Winter-- Summarize and report findings

Early Findings

The United States will not face a military "peer competitor" within the next two decades:

- Potential adversaries face serious obstacles

But, U.S. strategy will remain highly demanding:

- Expeditionary operations
- Growing regional capabilities
- Intolerance of heavy casualties, collateral damage
- Numerous commitments & demands

Therefore, U.S. force planning is properly focused on:

- Hostile regional powers
- Means for enhancing U.S. capabilities
  - Reduce cost & risk
  - Expand sphere of "high leverage" operations

RMA Gaming & Assessments:
The "Generic" Scenario

Iran attacks Kuwait/ Saudi Arabia

- High-speed ground offensive
- Amphibious assault
- Attacks on SLOCS, ships
- TBMs, Cruise Missiles
- WMD
- Terrorism

Emerging Challenges

Weapons of mass destruction & ballistic missiles

- Operational use (vs troops, ports, airfields, theater C3 and logistics)
- Strategic use (vs ally's cities, CONUS)

"Asymmetric" counters to U.S. projection forces

- Submarines, smart mines, ASMs
- Deeply buried bunkers
- Conventional TBMs, cruise missiles

Target saturation

- Dismounted operations
- Use of civilian assets
- Decoys

Trends in Future Warfare

Inter-theater deployments are becoming more challenging

- Short-warning attack options
- Threats enroute, in-theater

Fixed bases are becoming more vulnerable

- Esp. field logistics centers

Battlefields are becoming less dense, less "linear"

- Increased range and lethality of fires
- Increased mobility of forces

Future Theater Warfare: : Enduring Necessities (ca. 2010-2015)

Fire power and maneuver in combination

- Compel enemy to field and move heavy forces
- Occupy territory

Responsiveness and mass

A "man in the loop"

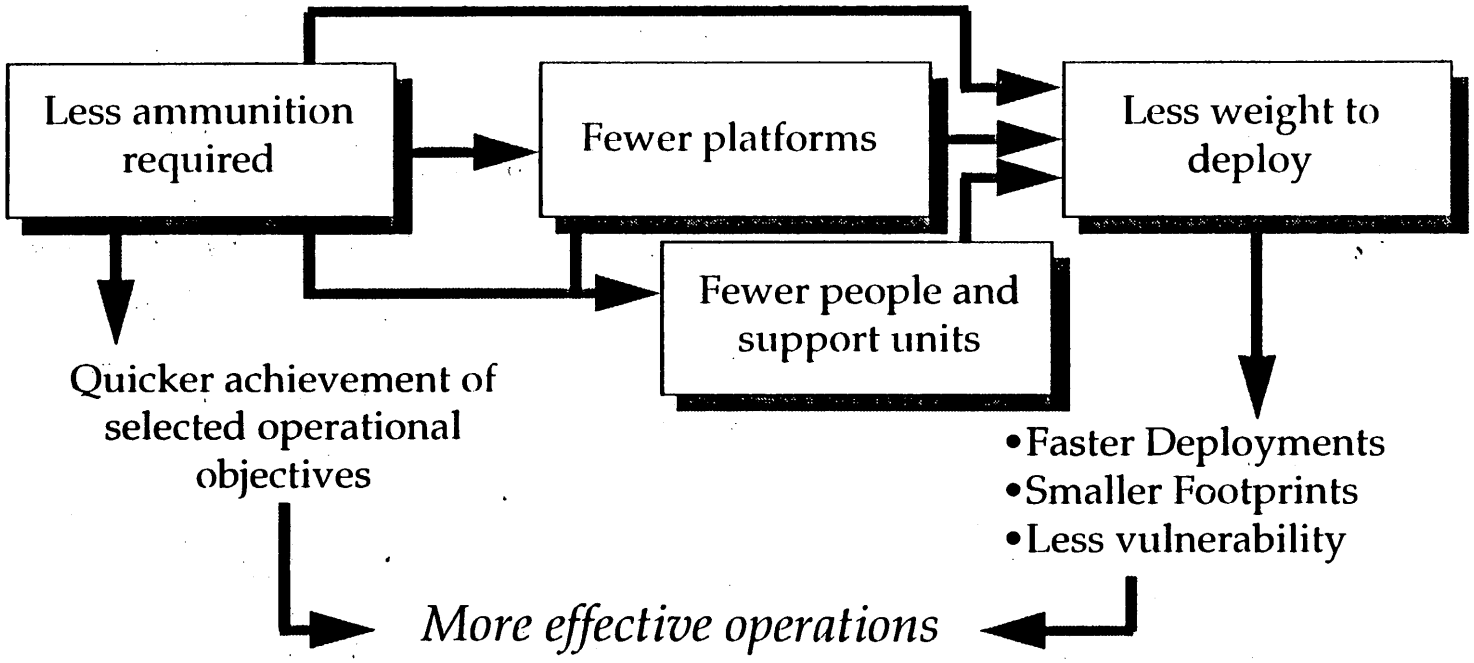
Platforms that can survive and operate on and over the battlefield

- Air superiority
- Maritime superiority
- Ground maneuver
- And the ability to exploit all three

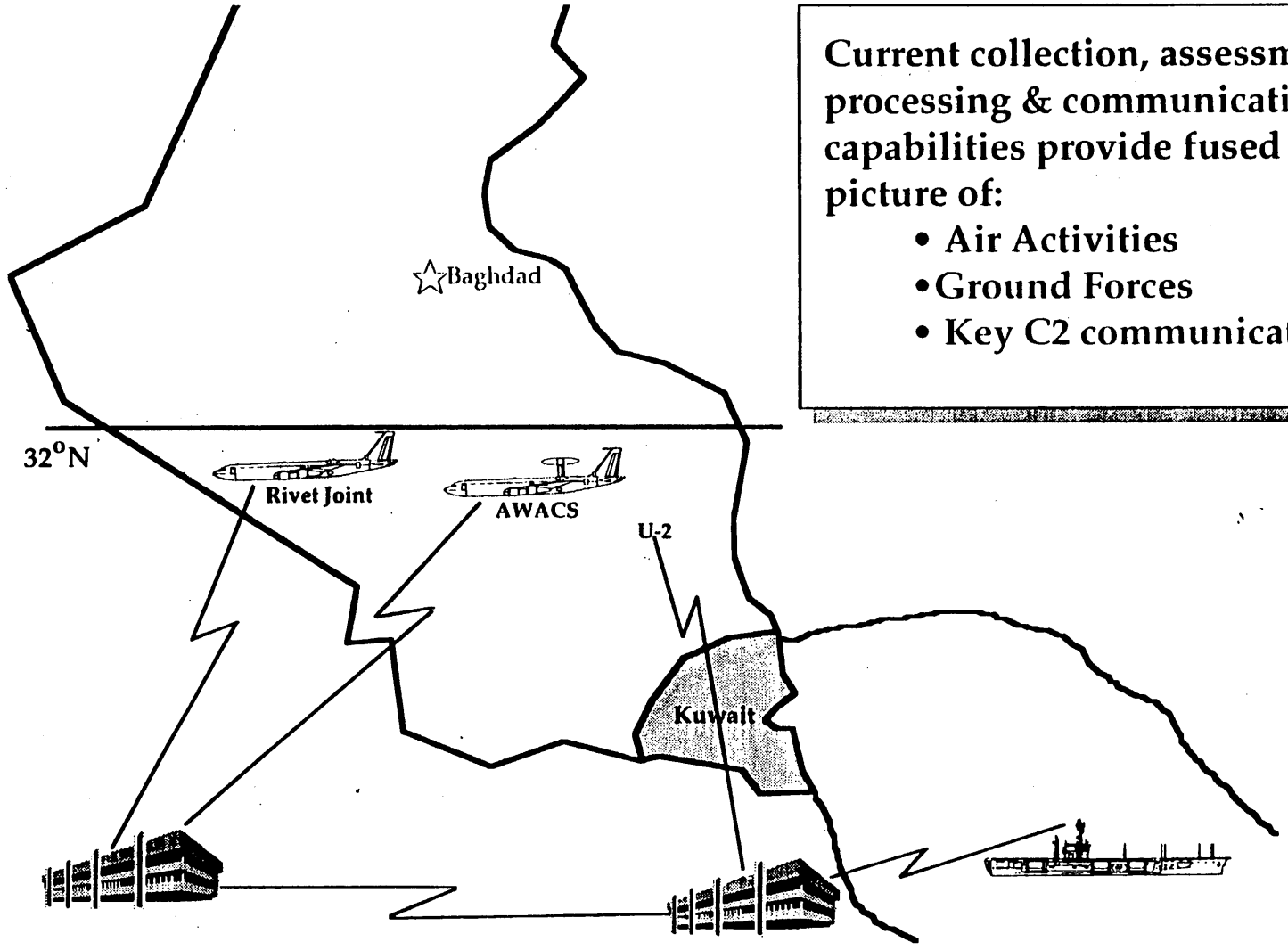
The RMA: "We're in one..."

Example: To neutralize one motorized rifle company w/MLRS

298,000 kg of DPCM = 3000 kg of BAT



The RMA: "We're in one..."



Current collection, assessment, processing & communications capabilities provide fused NRT picture of:

- **Air Activities**
- **Ground Forces**
- **Key C2 communications**

RMA: *"We're Missing the Boat"*

DoD is "preparing to fight the last war"

- Future adversaries will innovate
- Key components are available commercially

Our investment priorities are skewed

- Force structure crowding out funding for R&D, doctrinal, and organizational innovation
- Modernization is focused on "sunset systems " vice systems with revolutionary potential

Force Structure, doctrine haven't changed significantly

Cross-functional Development Priorities

- Battlefield surveillance
  - Long dwell time
  - All-weather
  - MTI
- Information management, protection, & denial
- Countering ballistic and cruise missiles
  - Active defense, including boost phase for TBMs
  - Hunter-killer operations vs. TELs, storage sites
- Long-range and precision attack
- Produceability and life-cycle cost reduction

The Organizational Dimension

RMAs are transitory phenomena

RMAs happen in organizations that:

- Take military operations seriously
  - Sustained focus on specific operational problem(s)
  - Integrity in evaluation systems
- Encourage experimentation
  - Centers of doctrinal development
  - Cross-pollination among differing specialties
  - Open-ended exercises
- Have access to technical innovations

The Problem(s)

Attention span...

- Key players have solid groundings in operations as well as strategy

- They also have many other responsibilities
  - Service program priorities
  - Joint actions (e.g., JWCA, roles and missions)
  - Service-sponsored studies
  - Plans development and review
  - Etc.

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DIRECTOR OF
NET
ASSESSMENT

February 6, 1996

MEMORANDUM FOR RMA SENIOR STEERING GROUP

SUBJECT: Recommendations for Establishment of RMA Concept Development Center

On 11 October 1995 the RMA Senior Steering Group directed that a study be conducted to examine options for establishment of a dedicated RMA Concept Development Center (CDC), as proposed by the Task Force on Fostering Innovation. Under the leadership of the Director, Net Assessment, a working group was formed with representatives from USD (Policy), USD (Acquisition and Technology), the Office of the Vice Chairman, Joint Chiefs of Staff, and ARPA. The working group conducted a three-month investigation into the full range of options for implementing the proposed CDC. The purpose and functions of the CDC, evaluation criteria, and alternative options studied are contained in Enclosure 1. As a result of this study effort, the CDC working group forwards the following recommendations:

1. Concept. Establish a formal RMA Concept Development Center to 1) conduct analysis into the long range implications of the RMA, focusing in particular on new concepts and organizations, and 2) serve as a critical catalyst for the development of innovative operational and organizational concepts throughout the military and private sectors by energizing and leading a broad program of innovative work. The director of the CDC to be a senior civilian reporting directly to the Under Secretary of Defense (Acquisition and Technology) and the Vice Chairman of the Joint Chiefs of Staff in their capacity as joint directors of the RMA Senior Steering Group. An independent senior oversight board to be established in order to provide independent review and broad direction of CDC operations.

2. Staffing. The CDC to have a professional staff of approximately 50, composed of about 20 civilians (including 5 administrative support) and about 30 commissioned officers from the four armed services. Approximately 20 of the officers to be 3-year staff members at the O-4 through O-6 level. The remaining officers to be 1-year "senior fellows" with identified flag potential, and assigned for exposure to CDC concepts between operational tours. Staff officers to receive war college and joint duty credit.

3. Funding. The CDC to be authorized a startup cost of approximately $1 million (staff relocation costs, space reconfiguration, computer support, etc.), and an initial annual budget of $4-5 million for basic operations (facilities and maintenance, civilian staff, travel), with an additional $4-5 million for contractor support. Funding to be identified for an FY 97 startup.

4. Sunset Provision. The CDC to be established with a set 10-year life span. This sunset provision should serve to keep the organization vibrant and innovative, and help to focus its efforts on specific issues relating to the current RMA.

5. Location. After reviewing all of the formal CDC implementation proposals and investigating related options, four primary candidates emerged:

1) Naval Postgraduate School (NPGS)/University of Southern California. A detailed concept proposal for joint affiliation is at Enclosure 2.

2) National Defense University

3) Johns Hopkins University Applied Physics Laboratory (JHU/APL). A detailed concept proposal is at Enclosure 3.

4) Affiliation with an existing FFRDC. A specific option for associating the CDC was explored with the Institute for Defense Analyses (IDA) as representative of the FFRDC community. Similar arrangements could be made with another FFRDC.

Of these options, the working group favors the proposal establishing the CDC on the grounds of the Naval Postgraduate School at Monterey, California, with direct administration through the University of Southern California, if feasible. Both the location of NPGS and the private university affiliation were seen to offer several unique features that make this option particularly attractive.

RMA Senior Steering Group Action. If the Senior Steering Group is agreed on the proposal to pursue establishment of a dedicated Concept Development Center, the following actions are proposed:

1. Approve or modify the above recommendations, including the selection of one or more CDC location options for detailed implementation planning.

2. Designate an implementation director and/or group to begin the process of establishing the CDC.

3. Initiate a process to identify, as early as possible, candidates for the position of director of the CDC and other critical staff members.

A. W. MARSHALL

The Concept Development Center (CDC)
Criteria and Options for Implementation

On 11 October 1995 the Under Secretary of Defense (Acquisition and Technology) approved in principle a proposal endorsed by the RMA Steering Group to establish a dedicated Concept Development Center (CDC) to pursue significant, long term innovation within the military. A senior working group was established with representatives of USD (Policy), USD (Acquisition and Technology), the Office of the Vice Chairman of the Joint Chiefs of Staff, and ARPA to explore various options for establishing such a center.

Background

A key finding of the 1994-95 Task Force on Fostering Innovation of the RMA Steering Group was that there exists no joint organization focused on warfighting over the long term (20-30 years out), and specifically on the development of new operational concepts and organizations for effectively exploiting emerging technologies. A number of institutions, including the war colleges, are seen as satisfactory for continuing near-term evolutionary change, but appear unlikely to generate the revolutionary innovations that may be needed for the US military to remain predominant over the next several decades. In particular, existing facilities like the doctrine commands and the Joint Warfighting Center deal primarily with concepts for utilizing existing military systems rather than exploring how emerging technologies might usher in a new regime of warfare with very different characteristics than those the military is now accustomed to. None of these organizations is seen to provide an adequate forum for truly innovative gaming and simulation or for continuous experimentation with non-traditional concepts. In addition, there exists no organization or construct to serve as a central network node or clearinghouse for facilititating the movement of new ideas between government, industry, and academia. The RMA Steering Group endorsed the establishment of a dedicated research center to fill these needs.

CDC Functions

The proposed CDC will provide two basic functions:

1) It will conduct and sponsor its own analysis into new concepts and organizations -- primarily through the venues of gaming, modeling and simulation.

2) It will serve as a critical catalyst for innovation throughout the military and private sectors, both energizing and leading a broad program of innovative work.

Enclosure 1

The CDC is meant to serve a critical role in generating new ideas, and more importantly, independently evaluating new concepts as they emerge. Probably the key functions of the CDC will be to conduct advanced modeling, simulation, and gaming of new concepts. With the use of Red Teams, the CDC will help to filter and identify those ideas that should be taken to the point of demonstration. This will require methods and procedures for moving ideas interactively between the CDC and those facilities involved in testing and experimentation of new concepts.

While a primary goal of the CDC is to generate and evaluate new ideas, it will perform an equally critical function of stimulating innovative efforts by the network of civilian and military activities that are exploring new technologies and generating new operational and organizational concepts. Sources of ideas for this innovation network will include:

- Private industry
- Think tanks
- Military services
- Unified/specified CINCs
- Academic institutions
- Intelligence community
- Foreign military-technical developments

Private industry in particular will continue to be a critical source of new ideas, and the CDC will provide the necessary interface to bring these concepts into the military arena for testing and evaluation.

The CDC will make significant contributions to the development of future doctrine, but the role of actually writing warfighting doctrine will remain with the joint and service doctrine commands.

Concept

It was a conclusion of the Innovation Task Force that the CDC should be a new organization -- not an added function of an existing institution. In the first place, the scope of change that the CDC will be investigating is not within the research purview of any existing organization. In the second place, the lack of an active consumer base for this type of long range thinking would continue to threaten the intellectual independence of the CDC if it became a subordinate component of an existing institution. Therefore the CDC should have the following characteristics:

- A full-time, dedicated effort devoted exclusively to exploring major innovations.

- Focused on the longer range.

- Offer an independent source of analysis and evaluation.

The working group concluded that the CDC must be located in an area where it is likely to stimulate and benefit from innovative activities, and must also be in a location that will attract the very best individuals to seek assignment there. The working group supported a recommendation that the CDC should be established with a 10 year sunset clause. This should serve to keep the organization vibrant and innovative, and help to focus its efforts on specific issues relating to the current RMA. In addition, the nature or interpretation of the RMA is expected to change significantly over the life of the CDC, thus redefining the primary issues to be explored and necessitating a new organizational approach. A follow-on organization could be created at the end of the 10 year period, if desired, to capitalize on the CDC's successes.

Resources

The cost of implementation and annual operations will vary depending upon the option that is actually chosen. Over and above basic operating expenses, the CDC will require a *research budget* to fund in-house activities and outside research/support, as well as a separate *investment budget* to offer significant stimulus to the private sector for the development of new concepts and ideas. In particular, the CDC is seen to require major investments for the development of new models and simulations. Most of the models that presently exist are assessed as not able to deal adequately with postulated future warfare concepts and systems -- especially the information aspects of warfare.

Staff

The most important factor in the ultimate success of the CDC will be the quality of the director and staff. The civilian director must have a broad background in both technical and organizational areas relating to the military. He must have an understanding of the implications of significant, long term change, and must understand the process of innovation in a large institution. He must be able to stimulate truly innovative activity both within the CDC as well as contractor and government institutions supporting the effort. The director must also exhibit the political skill necessary to remain focused on the most critical long range problems, and to ensure that new ideas and findings are injected into the defense organization for action.

The civilian/military staff must represent pertinent RMA technologies and gaming/simulation expertise, all of the armed services, and the primary specialties within those services. It would be highly desirable to have a stable group of military officers able to dedicate several years to innovative research. However, the short tenure of military careers argues for a second group of military officers -- senior fellows -- who would rotate rapidly through the CDC and thereby bring innovative concepts out to the fleet and field.

The types of individuals required for the CDC suggest a total staff of about 50: 15 senior civilians, 30 joint military officers (including 20 three-year staff and 10 one-year senior fellows), and five staff support personnel. Staff support requirements are based on an ability of the CDC to affiliate with a larger organization and share adminstrative and security support.

Supporting Recommendations

In addition to the CDC, the Task Force identified three supporting recommendations centering on the future threat:

1) The creation of a Future Threat Studies Group -- a senior advisory panel of both civilian and military officials from both the intelligence and policymaking communities. The primary function of the proposed group would be to focus analytical resources on threats to US national security over the long term -- particularly new types of threats resulting from the innovative use of emerging technologies.

2) The establishment of a dozen or more individual Red Teams -- each highly specialized and focused on military, political, and economic aspects of specific potential competitors and critical warfare concepts. Red Teams would serve as the key source for both critical insights into future warfare and for knowledgeable specialists to serve as challenging opposition players in war games conducted by the CDC.

3) The creation of a Security Group to identify and correct unforeseen vulnerabilities emerging from the US military's efforts to exploit new technologies and concepts in warfighting.

The CDC working group validated the need for these complementary initiatives to support the CDC operations, but proposed that implementation be pursued through a separate, follow-on effort.

CDC Selection Criteria

The CDC working group spent three months establishing criteria for assessing various CDC implementation options and examining in detail a full range of proposals. An initial effort of the group was to review the full range of existing research centers to identify areas of redundancy or complementary functions. The PA&E initiative to generate a list of all existing research facilities was of major assistance in this effort. The CDC working group concurred with the findings of the Task Force on Fostering Innovation that there is now no organization conducting or able to conduct the type of research envisioned for the CDC. There are, however numerous center either in existence or planned which perform complementary activities. Of particular note are the Joint Warfighting Center and the proposed C4ISR Decision Support Center. The output of the RMA CDC will be of direct applicability to these organizations as they try to plan for the longer term.

Each of the proposed CDC options was evaluated based on the following criteria:

1. *Intellectual independence*. It must maintain a long range focus on RMA-related issues in order to develop concepts for profound innovation and change. Its organization must allow it to remain above parochial interests of services and acquisition groups. However, CDC must also be integrally involved with all ongoing innovation

activities and must have significant high level influence to affect the decisionmaking process. Key factors for assessing intellectual independence included:

Physical separation from potentially dominant commands
Visible support from senior leadership
Freedom to hire and manage staff

2. *Location*. It must be physically located an area seen as attractive by both military and civilian personnel. The location must also be conducive to staff contact with related research activities. Key factors for assessing location included:

Quality of life factors
Proximity/access to mid-grade military officers in operational specialties
Proximity to high tech industry; especially information tech
Proximity to civilian/military research centers
Proximity to complementary military organizations (for exchange of concepts and ease of obtaining personnel)
Proximity to/access to military intelligence agencies

3. *Facilities*. Physical facilities must support individual study, as well as group conferences and symposia. The CDC must also have ready access to gaming and simulation facilities, with the option to create a tailored gaming and simulation capability for exclusive future use by the CDC. The facility must be able to support full interactive data links to the SCI level. In order to minimize startup costs, only rent or lease options of existing structures were considered. Key factors for assessing facilities included:

Gaming and simulation capabilities (either within the CDC or in close proximity)
Able to handle classified material to SCI level
Networked (or network potential)
--Internet
--COSPO/OSIS
--Intelink
--Videoteleconferencing

4. *Cost*. No going-in cost restrictions were imposed on the concepts under study. However, preliminary cost estimates for similar organizations were obtained from OSD (PA&E) which suggested the following nominal targets:

Startup costs: Under $1 million. This to be used for civilian relocation costs, minor facilities reconfiguration, telecommunications, and computer acquisition.

Operations and maintenance: Analysis of similar organizations and operations under consideration offered the following figures:

15 Civilian personnel: $2.25 million
30-40 Military personnel: No "cost" (However, these must be identified and filled from existing billets)
Facilities/O&M: $1.25 million
Travel, work: $1 million

Contractor budget: In order to provide an adequate level of research support, approximately $4 million is seen as an appropriate initial figure. The idea of a separate investment budget to offer significant stimulus to the private sector for the development of new concepts and ideas should be addressed after the CDC becomes operational.

5. *Political feasibility.* The concept chosen must be "sellable" to various constituencies with an interest in long range concept development. Key interests considered by the working group included OSD, the Services, the CINCs, JCS, and Congress.

6. *Timing.* The ability to achieve a rapid start-up to capitalize on current interest in RMA activities was seen as a distinct advantage for any option.

Implementation Options

The general options for the CDC fell into three basic categories:

o *Create the CDC as an entirely new organization.* This to include the establishment of a new UARC (University Affiliated Research Center) in conjunction with a private university or the creation of a new FFRDC.

o *Have the CDC take over an existing organization's functions.* This to be done in conjunction with outside efforts to identify potential candidates for consolidation from among existing research institutions that could instead be transformed into the CDC.

o *Associate the CDC with an existing organization.* This to include military organizations such as the Joint Warfighting Center (JWC) or the Joint Training, Analysis and Simulation Center (JTASC) in the Norfolk area; one of the war colleges; an FFRDC; or an existing UARC.

After initial review was conducted of a broad range of possibilities within these basic categories. A number of initially promising areas such as the research triangle of North Carolina and the technology centers near Boston, Massachusetts were eliminated because of poor relative ratings within the evaluation criteria. Eventually seven primary options covering a wide range of potential possibilities were selected for detailed investigation. Proposals for implementation were solicited and received from six organizations: the Naval Postgraduate School, the Joint Warfighting Center, the National

Defense University, the Applied Physics Laboratory of Johns Hopkins University, the Institute for Defense Analysis, and the University of Southern California.

Option 1. Taking over an existing research organization slated for elimination

Although a consolidated list of existing military research organizations is being compiled under the auspices of PA&E, our discussions indicated that there will be no formal review process within OSD to identify any specific research sites for consolidation or elimination. The individual services may make such a decision at some future time depending upon budget reviews, but that process is not certain, and falls well behind the timeline of the proposed CDC implementation schedule.

Option 2. Associate with existing FFRDC

A proposal was solicited from the Institute for Defense Analyses in Alexandria, Virginia as representative of the FFRDC community. A high level meeting was held with their senior leadership to discuss their proposal.

-- Location: Alexandria, Virginia; IDA proposes leasing office space in proximity to IDA headquarters

- o Limited military housing available.
- o Good access to military support facilities (clinic, PX, etc.) in the Washington area.

--Facilities availability/cost: Sufficient office space is available for lease in the Alexandria area. Administrative support to be provided by IDA.

--Close to Washington and the Pentagon. Washington area was seen in both a positive and negative light for all options. However, proximity to DC offers access to senior leadership as well as a broad pool of joint officers for consideration as prospective staff.

--The Washington area was not seen as an attractive civilian high technology center relative to a number of other areas of the country.

--Proximity/access to complementary military/research organizations is good:

Air Force Studies and Analysis Agency
US Army Concepts Analysis Agency
US Army Research Lab
NDU War Gaming and Analysis Center
Naval Research Lab
Center for Naval Analyses
Marine Corps War Gaming and Analysis Center
Naval Surface Warfare Center (JWAC) - Dahlgren
JCS/J-8/Wargaming Analysis Division

--Proximity/access to military intelligence agencies is excellent: DIA, CIA, NSA, Services are all readily available.

--Able to use admin/support structures of existing organization: IDA would provide.

--Access to gaming and simulation capabilities is fair: IDA, Defense Modeling and Simulation Office is onsite, but applicability to RMA-related issues needs to be determined.

--IDA is able to handle classified material to SCI level

--IDA is, or could readily be networked with complementary organizations through Internet, COSPO/OSIS, Intelink

--Association of the CDC with an existing FFRDC was seen to have some negative political connotations in that the center might come be viewed as a subordinate agent of the FFRDC regardless of actual independence.

Concept:

IDA leadership was very positive and supportive of the proposal, and were most favorable to taking this on. Their concept is to establish the CDC as a separate center reporting directly to the IDA president (similar to IDA's existing technology centers at Princeton, La Jolla, and Bowie). They favor the CDC being as independent as desired, but believe that close physical proximity to IDA in Alexandria would allow the center better access to IDA's administrative support structure. The CDC would be located in leased commercial office space near IDA's headquarters. Their estimate of annual cost fell within budget targets of the CDC working group. One problem identified for FFRDC association is the congressional budget ceiling on FFRDC funding. IDA would be unable to take $5-10 million out of its own budget for CDC support, thus necessitating an increase in the budget limit. IDA will not consider a non-FFRDC affiliation as a possible alternative. Although proposals were not solicited from other FFRDCs, it is felt that IDA's response is representative of other possible FFRDC affiliations.

Option 3. Existing UARC: Johns Hopkins APL

A proposal was solicited from the Applied Physics Laboratory of Johns Hopkins University (Enclosure 3) as representative of UARC affiliation and meetings were held with their senior leadership. As by far the largest of the existing UARCs, JHU-APL may be the only candidate that could feasibly administer the CDC. In addition, the other UARCs are not located in geographic areas that would appear supportive of CDC functions (Universities of Washington and Texas, Utah State, Penn State, and Georgia Tech), and appear too narrowly focused on very selective military systems.

--Location: Laurel, Maryland. APL would lease their own or commercial space in the area depending upon the specific needs of the CDC.

- Limited military housing available in the Washington area
- Military facilities (clinic, PX, etc.) readily available (Ft Meade)

--Facilities availability/cost: Actual cost to be determined, but will fall within CDC budget targets. Administrative support to be provided by APL.

--The location of APL is more remote from DC, offering some physical separation from potentially dominant commands -- yet ready access to senior DoD leadership. Being

located in the DC area, APL offers access to a fairly large pool of joint officers for potential staff.

--The Maryland area is not seen as a high tech center on par with Silicon Valley, for example. There is a good depth of engineering expertise extant at APL, although tending to be highly specialized -- especially in naval systems.

--Proximity/access to complementary military organizations is excellent:

Air Force Studies and Analysis Agency
US Army Concepts Analysis Agency
US Army Research Lab
NDU War Gaming and Analysis Center
Naval Research Lab/ONR
Center for Naval Analyses
Marine Corps War Gaming and Analysis Center
Naval Surface Warfare Center (JWAC) - Dahlgren
JCS/J-8/Wargaming Analysis Division

--Proximity/access to military intelligence agencies is excellent: NSA, DIA, CIA, service agencies are in close proximity

--Able to use admin/support structures of APL, this includes existing security to the SCI level

--Access to gaming and simulation capabilities: APL Naval Warfare Analysis Department/Warfare Analysis Lab. This is a Navy-focused battle lab. The applicability to RMA functions needs to be determined. It is also questionable how much time the CDC might have available in sharing such facilities.

--Able to handle classified material to SCI level

--Already networked with Internet; Intelink will be available in early 1996.

Concept:

The APL leadership is very positive about the concept and is anxious to take it on. They have proposed several different implementation options, including establishing the CDC through existing contract vehicles as a separate program activity (about 3-20 weeks startup), or establishing the CDC through a separate contract (startup within days, although contracting will take months), or a combination of both approaches with start-up via an existing contract vehicle followed by a transition to a separate contract. APL has proposed making some of their staff available to the CDC on term appointment basis until permanent staff are brought on line. APL is an excellent location for the CDC to serve as a central network node due to existing APL joint research relationships. Analysis is one of JHUs and APLs central capabilities; they see the CDC as beneficial in helping push APL's thinking out to longer range

Option 4. National Defense University

A proposal was solicited from the National Defense University. The other service-specific war colleges were considered, but the remote locations of these schools and lack of strong showing in other evaluation criteria combined with service specialization caused

them to be deleted from the list of candidates. High level meetings were held with their senior NDU leadership to discuss the concept.

--Location: Ft McNair, Washington DC

o Limited military housing is available in the Washington area

o Military facilities (clinic, PX, etc.) are readily available at Ft McNair and the Washington area

--Facilities availability/cost: There is no available space for the CDC within NDU itself. Space is likely to be available in the old commissary building (recently refurbished) at Ft McNair and at Coast Guard Headquarters adjacent to Ft McNair. Cost to be determined but was estimated by NDU to be within budget targets.

--Close proximity to DC a plus for senior level contact. Proximity to NDU also provides not only a pool of potential staff officers, but ready access to front-running senior officers from all services who would benefit from exposure to CDC activities.

--The NDU area is not equated with any civilian high technology activities.

--Proximity/access to complementary military organizations is excellent:

Air Force Studies and Analysis Agency
US Army Concepts Analysis Agency
US Army Research Lab
NDU War Gaming and Analysis Center
Naval Research Lab
Center for Naval Analyses
Marine Corps War Gaming and Analysis Center
Naval Surface Warfare Center (JWAC) - Dahlgren
JCS/J-8/Wargaming Analysis Division
Johns Hopkins APL

--Proximity/access to military intelligence agencies is excellent: DIA, CIA, NSA, service agencies are in close proximity.

--Able to use admin/support structures of existing organization: NDU would make its full admin support services available.

--Access to gaming and simulation capabilities: NDU War Gaming and Analysis Center is available. The applicability of this center to CDC requirements remains to be determined, and the availability of the war gaming center for time sharing with the CDC is also not known.

--NDU has facilities able to handle classified material to the SCI level

--NDU is or could be networked with complementary organizations

Concept:

The NDU leadership is very positive about both the CDC concept and their possible affiliation with the CDC itself. The NDU leadership is presently trying to reorient the university to become a center of innovative research within the military as well as an educator of future leaders. They see the CDC as one potential component of ongoing NDU initiatives to promote:

--Sustained, coherent inquiry into future national security environment

--NDU leadership in independent strategic assessments, policy analysis, and simulations

--NDU as *the* intellectual center within DoD for national security implications of information tech

Although they readily embrace the CDC concept, a question arose as to the extent the CDC might become subordinated to overarching initiatives and activities ongoing within the NDU structure that might serve to limit the intellectual independence and outside range view of the CDC itself. Nevertheless, terms of relationship could likely be established that would satisfy both sides.

Option 5. Naval Postgraduate School

A formal proposal was solicited from the Naval Postgraduate School in Monterey, California. Other service specific schools (e.g. AFIT) were not investigated in detail because the central California location of NPGS was the primary attraction rather than military affiliation. NPGS is amenable to any number of relationships, but feel that an a joint operation with a private university -- the University of Southern California -- best meets the goals of the CDC. The full NPGS response is at Enclosure 2.

--Location: Monterey, California. This was seen as the most attractive area in terms of quality of life, proximity to a civilian technology center, and existing military facilities.

- o Military housing is available at Ft Ord
- o Military facilities (clinic, PX, etc.) are readily available at NPGS and Ft Ord

--Facilities cost: Availability of space on the NPGS campus remains to be determined -- they have offered the option of using preexisting facilities. Tailored modular facilities could also be acquired and located on campus for an annual lease within budget target figures.

--NPGS is physically separated from potential dominant commands. It is remote from DC which promotes intellectual independence, but also may inhibit direct personal contact on a regular basis with senior OSD leadership. The California location reduces the size of the joint officer pool that might be available without PCS funding to staff the CDC. However, with a permanent staff of 20 on a three year rotation and another 10 on one year rotation, each of the services would only have to fund perhaps 4-6 PCS moves per year to support continued CDC operations.

--Close proximity to civilian high tech center at Silicon Valley is seen as a major advantage, especially given the anticipated focus of CDC activities on exploration of the impact of information technologies.

--Proximity/access to complementary military organizations is fair:

Consolidated Space Test Center - Onizuka
National Training Center - Ft Irwin
Naval Research Lab - Monterey
Naval Warfare Analysis Center - Corona

--It is remote from military intelligence agencies, but SCI-level data links are currently available that can mitigate the physical separation.

--Will be able to use admin/support structures of NPGS

--Limited gaming and simulation facilities are likely to be inadequate for long term CDC needs. As anywhere, establishing such capabilities would likely be a long term investment by the CDC itself.

--NPGS is able to handle classified material to the SCI level. Modular office/conference facilities will likely be cleared up to the secret level. A new NPGS SCIF has been completed for the school. Part if not all of the old SCIF space could be made available for use by the CDC.

--NPGS is networked with complementary organizations through Internet, COSPO/OSIS, Intelink.

Concept:

NPGS is very positive about this concept and is anxious to develop the relationship. Their primary option proposes a joint operation with the University of Southern California. USC would actually provide the administrative vehicle, with the CDC physically located on the NPGS campus (reminisicent of the former relationship of CNA with the University of Rochester). The advantage of this arrangement would be to allow an independent salary structure for CDC civilian staff, reduce government administrative bureaucracy, and to offer an independent "board of overseers" to help maintain the CDC's intellectual independence. As noted below, the legal and contractual implications of this type of arrangement need to be determined.

Option 6. Private University/New UARC: University of Southern California

A proposal was solicited from the University of Southern California for both locating the CDC on campus and for USC administration of the CDC at a remote location. Other private universities could equally be considered, but USC proved amenable to the arrangement and is considered representative of potentially similar relationships with other schools.

--Location: Los Angeles area seen as marginally attractive both from a military and a technology point of view. The primary focus of attention centered on locating the CDC in the Silicon Valley area with administration by USC. Two locations studied in some detail were facilities at the former military bases at Ft Ord and Moffett Field, as well as on the campus of NPGS (discussed above).

--Facilities availability/cost

USC: "Normal overhead charges" would be negotiated for both on- and off-site options. In addition, there would likely be a USC fee to be used to support student and faculty research.

Ft Ord: Abandoned office space is available; condition and cost TBD. Housing is available along with clinic, PX, etc. Locating an isolated CDC at Ft Ord itself seemed to offer no advantages and was seen as distinctly inferior to colocating the center

with a research or academic institution. The cost of placing the CDC on the grounds of NPGS is about the same, and was assessed to be a far superior option.

Moffett Federal Airfield (administered by NASA). This location is attractive because of its close proximity to technology companies in Silicon Valley and to Stanford University. Office space available on cost-share basis with NASA at very low rates -- about $3.00/sq ft/year exclusive of O&M. Total cost would be about $7-8/sq ft/year. Renovation/repair would be at the CDC's own expense, and would depend entirely on the facilities needed. It may be cost prohibitive to consider SCI access within the CDC itself if located either at Ft Ord or Moffett. Moffett is close to Stanford University and some high tech facilities, but remote from NPGS (about 90 minutes driving time). Housing on site is unlikely (Onizuka has it filled), but Moffett still has a commissary, exchange, and golf course.

--The location is physically separated from dominant commands, as well as remote from any large pool of potential staff officers.

--Proximity/access to complementary military organizations is fair:

Consolidated Space Test Center - Onizuka
National Training Center - Ft Irwin
Naval Research Lab - Monterey
Naval Warfare Analysis Center - Corona

--It is remote from military intelligence agencies, and this might not be mitigated if SCI-level Intelink were not readily available.

--The ability to use the admin/support structures of USC would be very limited if it were located off-campus and not in conjunction with some other facility. The cost to create a dedicated admin support structure for the CDC would add significantly to the cost and administrative burden on the staff.

--USC schools/centers:

Engineering and Business schools
Information Sciences Institute (Marina del Rey)
Institute for Robotics and Intelligent Systems
Center for Effective Organizations
Center for Telecommunications Management

--Access to gaming and simulation capabilities is questionable. The CDC would likely have to fund its own facilities.

--Location on the USC campus or non-military facility would likely limit access to classified material -- especially at the SCI level.

Concept:

The USC administration is amenable to any number of options. They are clearly positive about the concept -- their primary proposal being for administration of a center located physically on the campus of NPGS. Staff could either be university faculty or an independent group that establishes its own pay scale, pay raises, and promotion rules. As a private university, USC does not have a formal salary schedule, and therefore offers considerable flexibility in individual salaries. This is seen to be a very major advantage in the CDC's ability to attract and keep the right staff.

The legal and contractual implications of the NPGS-USC arrangement needs to be worked out in further detail. The proposal to establish the CDC as a new UARC appears somewhat problematic and may not prove to be the best vehicle. UARCs are non-competitive contracts funded on a per-project basis with individual universities. The government's relationship with a university is the same as with any contractor. As such, there is no "center" funding nor are there any standard overhead figures except established manpower rates. All UARCs to date have been justified on the grounds of obtaining access to very specific technical or engineering expertise that is available only at the host university. Although the proposed CDC funding levels fall within the UARC framework, it is not known whether USC specifically could be justified as a parent organization on a non-competitive basis. An alternative option is to advertise competitively for a private university to adminster a CDC located at NPGS.

Option 7. Joint Warfighting Center

A potentially natural connection was seen between the CDC and the existing Joint Warfighting Center in the Tidewater area. A concept proposal was solicited (Enclosure 4).

--Location: Ft. Monroe, Virginia. This area has numerous compementary military organizations, but is less attractive as a center of technological innovation and academics.

- o Military housing is availabe in the Tidewater area
- o Military facilities (clinic, PX, etc.) are readily available

--Facilities availability/cost. Undetermined, but likely to fall well within the cost targets established for the CDC.

--Close to USACOM, service doctrine commands, operational forces. The area offers a large pool of potential staff officers, but also greatly increases the prospect of the CDC direction being overtaken by local parochial interests. The Norfolk area is not recognized as a civilian high tech or academic center. Collocation with such a center was assessed to be far more significant than collocation with existing operational military activities.

--Proximity/access to complementary military organizations is good:

Air Force Doctrine Center
Joint Training, Analysis, and Simulation Center
Joint Warfighting Center
Air Combat Command
USACOM
Proposed C4ISR DSC

--Remote from main military intelligence agencies, although ready access is available through USACOM and other local commands.

--If affiliated with the JWFC, it would be able to use existing admin/support structures.

--The Norfolk area offers gaming and simulation capabilities through JTASC, and possibly the Joint Simulation Systems (JSIMS) (future simulation core for training joint task forces), although availability to the CDC and applicability to RMA research is

undetermined. The C4ISR DSC has been proposed for location in the Tidewater area (among others) and would likely prove a highly beneficial capability for the CDC. Nevertheless, the fate of this organization is uncertain and its availability does not outweigh other factors.

--Would likely be able to operate at the SCI level and be with complementary organizations through Internet, COSPO/OSIS, Intelink, etc.

Concept:

The response from JWFC was generally positive, and offered possible integration with a proposed organization to implement the Joint Vision 2010 concept. They see a very similar direction for their center, but with a different timeframe -- thus offering the possibility of largely complementary operations. They see great benefit in close and formal association between the CDC and JWFC, but expressed skepticism about whether the CDC concept is not premature in the absence of an overarching strategy by DoD for dealing with long range change.

The feeling of the working group was that the placement of the CDC with JWFC might introduce factors into implementation that would detract from the CDC's ability to move out very rapidly and see real near-term progress. The geographic location of Norfolk, Virginia was seen to offer some disadvantages, relative to Washington, DC and California.

Primary Options

After reviewing all of the formal CDC implementation proposals, and investigating various related options, the CDC working group arrived at a consensus on four primary candidates:

1) Naval Postgraduate School/University of Southern California

2) National Defense University

3) Johns Hopkins University Applied Physics Laboratory

4) Institute for Defense Analyses

These options provide all of the basic requirements for potentially successful CDC operations, not the least of which is an enthusiastic response by the affiliated organization. The costs associated with both startup and operations fall within the same budget target for each of them, and was thus not a determining factor in selecting among them.

In the view of the CDC working group, locating the CDC on the grounds of the Naval Postgraduate School, with administration by a private university appears to offer the best prospect for establishing the truly innovative and high caliber organization that is being sought. The following factors make the NPGS option stand out from the others:

1) It is a physically attractive geographic location near a recognized global technology center. Information technology is a core element, if not the core element of the emerging RMA. Silicon Valley is likely to continue to be a worldwide center of information technology development.

2) It offers close association with highly regarded civilian and military academic institutions, with the private university affiliation providing an optimum level of intellectual independence. The concept is attractive not only to potential staff officers, but to other individuals from a wide range of backgrounds who would be interested in short sabbaticals to assist with CDC work.

3) It offers a large body of joint mid-grade officers for direct exposure to and interaction with innovative concepts.

--The CDC can provide direction to and benefit from student research in related areas.

--CDC association will serve to expose continuing generations of joint officers to long range RMA concepts and for the need to foster innovative thinking within the military ranks. Of particular long range value are the large numbers of officers leaving academia to return to mid-grade fleet and field assignments. These individuals can take new concepts and ideas directly with them to the operating forces where applicability can be explored and new ideas fostered.

--The student body offers a pool of bright young officers for potential future CDC staff assignment.

--The subordination of the Defense Language Institute to the President of NPGS offers a close association with military attaches in training. The CDC can help orient these individuals to new collection and analytical needs of a changing threat -- and provide direct links from foreign RMA developments back to the CDC.

Implementation

If the RMA Senior Steering Group is agreed upon the proposal to establish a dedicated RMA Concept Development Center, the following actions are proposed:

1. Approve or modify the CDC concept recommendations, including the selection of one or more options proposed for the CDC location to be the subject of further implementation planning.

2. Designate an implementation director and/or group to begin the process of establishing the CDC.

3. Initiate a process to identify as early as possible candidates for the position of director of the CDC and other critical staff members.

Initial implementation actions will include:

o Investigation of the feasibility of options specifics

o Development of five year cost/staffing projections and work schedule

o Negotiation with the affiliated institutions

o In conjunction with the affiliated institution(s), establishment of an independent senior oversight board.

o Identification of initial staff to begin operations.

RMA Concept Development Center
Proposal submitted by the
US Naval Postgraduate School and the University of Southern California
19 January 1996

Introduction

This paper outlines the basis for an agreement between the Secretary of Defense, The President of the University of Southern California (USC), and the Secretary of the Navy for the establishment of a new Concept Development Center(CDC) to be located on the campus of the Naval Postgraduate School (NPS), and managed by the University of Southern California. If this paper is deemed to reflect the understanding among the parties, it can form the basis on which a contract between the Department of Defense (DoD) and the University can be drawn up. Such a contract would include all clauses which statutes, executive orders or the Armed Service Procurement Regulations require. In the event of any ambiguity or inconsistency between the provisions of the two documents, the provisions of the contract would control.

Objectives

The objective of the DoD, USC and NPS initiative is to fill a gap in the present intellectual resources of the DoD: namely to create an organization that will focus on the long term impact of emerging technologies on successful joint war fighting, deterrence, coercive diplomacy, and the character and role of war. The success of the enterprise depends to a very great extent on three things:

First, the organizational format must guarantee an independent and sustained focus on the subject. Imbedding the CDC within an existing organization without safeguards against the gradual evolution of the focus toward the larger goals of the parent is unlikely to achieve this goal. The USC/NPS partnership addresses this issue.

Second, the selection of the director and the selection and composition of the core civilian staff must be given the highest priority by all interested parties. This will determine the quality, character, and usefulness of the organization and its products. Above all, every member of this group must be highly intelligent, innovative, and believe passionately in the importance of the work. A tough minded sense of reality and pleasure in hard work is also essential. While the composition of the group should be worked out with due deliberation and in consultation with the sponsor, these specific skills must be represented: Economics, Systems Analysis, the Physical Sciences, Computing, Information, Telecommunications, Electrical Engineering, System Engineering, and Human Behavior. A general awareness of the biological sciences, especially Molecular Biology is important, but it cannot be expected that a first rate biologist could be attracted away from the laboratory to the permanent staff. However, Stanford, UCSC, and UC Berkeley are world renowned centers in the field, easiliy accessable to the CDC, and some useful affiliations could be developed. The group as a whole must be committed to

the use of rigorous speculative tools such as gaming, modeling and simulation, but they must also be profoundly aware of the importance of validation and the difficulties that this entails in this specific context.

Third, the director must be a person of sufficiently high achievement and stature so as to achieve durable two-way communication with the highest levels of the Department of Defense. He should be the kind of person who is sought for membership in one or more of the top advisory boards of the DoD such as the DPB, the DSB, the Jasons etc., and such memberships should be encouraged in general for the top staff of the CDC. Not only would such memberships serve as a conduit for timely information to the CDC, but also they would serve to raise awareness of the organization and its work.

Specifically the CDC will perform two basic functions:

1) Conduct and sponsor analyses exploring and evaluating new operational concepts and organizational innovations related to war, and the changing nature of war.

2) Energize and extend innovative work in promising areas throughout the DoD, in the private sector, and universities.

The activities of the CDC are intended to capture and synthesize new ideas, to stimulate their development elsewhere, and to provide an independent capability for their evaluation as they emerge. To that end the CDC staff will seek out and identify innovative thinkers, and sponsor conferences and gaming sessions that bring these people into contact with one another. One important function of the CDC will be to create imaginative competitor teams and stimulate the creation of such teams elsewhere whose function is to think innovatively to identify exploitable US vulnerabilities, either those that exist or will probably develop, or those that may be implicit in new concepts. This will help to filter and identify those ideas and concepts that warrant the cost of demonstration. A major aim of the CDC itself will be to explore and develop better ways of moving ideas interactively between concept developers and organizations involved in the testing and experimenting with new concepts, a long-standing and difficult problem.

While a primary goal of the CDC is to generate and evaluate new ideas, an equally important function is to stimulate innovative efforts throughout the full range of organizations and activities that are exploring new technologies and generating new operational concepts. The list of organizations that can be expected to contribute to the process includes:

OSD Staff	Universities
Analytic research organizations	Military services
Joint CINCS	Intelligence community
DoD, Service, and National Laboratories	Private industry

It should be emphasized that the network should be thought of as international, and also that some of the most innovative minds work independently, outside the structure of these organizations.

While it is expected that the CDC will make significant contributions to the advancement of new operational art, it is fully recognized that the responsibility for reducing the new concepts to authoritative war fighting doctrine will, of course, continue to rest solely with the JCS and the military services. The CDC supplements the military research extant on the war college campuses with scientific and technological expertise that is in short supply there.

Proposed Organization and Cost

Initially the organization will comprise about 17 civilian professionals, 48 military officers and 28 support staff, as follows:

Office of the Director (3/2/7)
- Director
- Deputy Director (Senior retired military officer)
- Administrative officer/Security officer
- Conference coordinator
- Deputy Director for Joint Military Affairs

Senior civilian Professional staff (10/0/6)
War Gaming and Simulation Group (3/4/3)
Military analytical staff (3 year assignments) (0/30/9)
Senior Military Fellows (1 year assignments) (0/12/3)

The numbers in parentheses indicate civilian professional/military professional/support.

The above numbers will be augmented by participation of the faculty of the Naval Postgraduate School and USC, expansion and use of the NPS wargaming facilities, and a program of visiting scholars and conferences.

The direct cost of such an enterprise (not including military pay and allowances or military travel) would be about $8,500,000 per year. The relatively modest war gaming effort presumes a close relationship with NPS and a reimbursable contract with NPS to expand and further develop the existing NPS war gaming laboratories to support the work of the CDC. It also includes the support of about four man years of NPS faculty effort. The cost of both the NPS faculty and gaming support would total about $1,000,000 per year. This is included in the above figure, as is about $400,000 to support USC faculty working on projects that would benefit the CDC. $500,000 has been reserved in the budget to support conferences. The above structure and budget are meant to be illustrative; the actual numbers would depend on the level of the contract.

The Postgraduate School's Role

In addition to providing real estate, the Postgraduate School offers much to the CDC. Unlike most DoD educational institutions, the faculty of the Postgraduate School is composed of civilian scholars with emphasis on research as well as teaching. The NPS research program is diverse and much of it is relevant to the work of the CDC. In FY 1995 the overall research budget was over $25 million. The NPS research report for FY 1994 and a listing of recent student theses is attached. Several faculty members are deeply committed to understanding the implications of the RMA, and would contribute at once to the program of the CDC. An important reason for placing the CDC at the Postgraduate School is to encourage useful interaction between the two organizations, and to use the resources of the Postgraduate School to amplify the efforts of the CDC. NPS represents a truly unique combination of attributes. Fundamentally it is a graduate engineering school with its feet firmly imbedded in the laboratory and those aspects of science and engineering that are relevant to the conduct of war. As such it works on the cutting edge of many aspects of science that are driving the RMA. It also has strong Operations Research and Management departments. In addition to the departments, a number of interdisciplinary groups and curricula exist in areas such as Combat Systems, Joint C3, Special Operations, Information Warfare, Joint Warfare, and Space. The Institute for Joint Warfare Analysis, already established on the NPS campus, provides for the formal linkage between the two organizations.

A further amplification of the CDC efforts could come from interaction with NPS students and working with students to direct their thesis research into areas of interest to the CDC. The NPS student body is diverse, and many come to the School from operational assignments. Not only are all services represented, but there is also a substantial group of international officers. In some cases top students who work with the CDC on thesis projects may shift to the staff of the CDC upon graduation, thus serving in a "payback tour" immediately and saving the cost of a PCS move. The location on the NPS campus would give the CDC an inside track in seeking out and identifying the most innovative and creative minds among the students best suited to the work of the CDC. From time to time an assignment at the CDC could be combined with a doctoral program in an area of particular relevance to the work of the CDC, thus enhancing for the participant what should be viewed as a very attractive assignment.

The School is currently certified by the Chairman of the JCS as meeting the intermediate-level Phase I Program for Joint Education.

Fall 1995 NPS Student Enrollment: 1506

Army	Navy	Air Force	Marine Corps	Coast Guard	International	US Civilian
145	955	29	155	15	190	17

The Air Force numbers are unusually low at the moment.

The above mentioned funding of about four man years of faculty work (16 individual quarters) plus some travel, and providing offices for involved NPS faculty at the CDC would guarantee a lively and productive interaction between the CDC staff and the NPS faculty. Top management of the NPS sees the catalytic role of the CDC as potentially having large benefits for NPS as well as for the CDC and others. They enthusiastically anticipate the CDC on the campus, and are prepared to do all in their power to underwrite its success.

The location in Monterey places the organization at the southern end of Silicon Valley, a center of innovation in several pivotal RMA areas. Stanford, The University of California, the Livermore National Laboratory, and a host of other cutting edge intellectual enterprises make the area one of the most desirable for an organization with the purposes of the CDC. The attractive living conditions on the Monterey peninsula contribute to the prospect of attracting the very best people to the CDC. There is easy transportation between Monterey and USC and the Southern California area, which also includes other major research universities, defense contractors, and organizations like RAND and Aerospace. Modern telecommunications networks provide the means for a full range of communications with Washington and other areas which have relevant defense installations. Today NPS conducts courses from Monterey in Crystal City and at other remote sites using interactive teleconferencing.

NPS will designate Professor Patrick Parker, a distinguished senior faculty member in the Institute for Joint Warfare Analysis with DoD and industrial experience, to work with the CDC and provide the energy and knowledge to see that the CDC captures the maximum benefit from the NPS affiliation. Professor Parker has served as Director of Tactical Air programs in OSD(SA) and as DASD(I), President and CEO of the Hickok Manufacturing Company, and Associate Dean and Professor at the Graduate School of Business at the University of Rochester. He has been a member of numerous DoD study groups and boards and served as the first chairman of the CNO Executive Panel. He has been a member of several corporate boards and also that of The Center for Naval Analyses. He is currently Chairman and CEO of the Aequus Institute, a substantial charitable trust of which he was one of the founders. Professor Parker has long been an advocate of greatly broadening, deepening and enriching the texture of thinking about long run threats to United States security. He would play an active role in supporting the construction of Red Teams. He believes in the importance of the CDC and is committed to its success.

USC's Role

USC brings the full resources of a major private university to the Center. USC is an AAU Research University which has strong, nationally-ranked professional schools, including Engineering and Business, as well as many research centers such as the Information Sciences Institute, the Institute for Robotics and Intelligent Systems, the Center for Effective Organizations, and the Institute for Telecommunications

Management. These centers are all on campus except for ISI, which is at Marina del Rey. Last year, USC received $223 million in outside research support.

An important function of USC would be oversight. To this end USC would create a Board of Overseers for the CDC. This board would include at least one senior retired military officer from each service chosen for both joint experience and a proven record of innovative thinking. It would also include about four serious thinkers with experience in the national security establishment, and a like number of leading scholars in areas deemed to be of underlying importance to the RMA.

It is envisioned that Dr. Jack Borsting would head this board and spend about one third of his time on CDC matters. Dr. Borsting offers high level experience in DoD, Industry and NPS: he has served as Assistant Secretary of Defense and as Provost of the Postgraduate School; he is currently the Executive Director of the Institute for Telecommunications Management and E Morgan Stanley Professor of Business Administration. Previously he was Dean of the School of Business Administration at USC. At present he is a Trustee of IDA and formerly served as a Trustee of the Aerospace Corporation and The Center for Naval Analyses. Dr. Borsting is also Past President of the Operations Research Society of America and of the Military Operations Research Society. His military service was as a nuclear weapons project officer in the Air Force.

The USC research funds would be used to fund projects which would benefit the CDC and would be open to all scholars in the University. Every effort would be made to involve USC faculty and students in the Center's projects.

The Role of the Senior Fellows

The Senior fellows are officers at the 06 level who are regarded by the leadership in their services as having a very high probability of selection for flag or general officer rank in the near future. Unlike the less senior military staff, who are expected to spend a regular three year tour at the CDC, these officers would be assigned for one year. While they are expected to make significant contributions to the work program of the CDC, an important reason for their assignment is to develop a cadre in the flag and general officer ranks in all the services with a keen appreciation for the implications of the RMA. The model for the senior fellows is the Navy's Strategic Studies Group.

Practical Considerations

The Director of the CDC will report to the Deputy Secretary of Defense and will be an ex officio member (or observer) of the RMA Steering Committee. The research program of the CDC will be worked out on an annual basis with the RMA Steering Group. It must be recognized that some fraction of the work of the CDC may not appear to have direct military relevance. Indeed if the relevance of the entire CDC work program could be clearly stated, then the CDC would probably not be doing its job. Truly

innovative thinking requires deep curiosity and wide ranging speculation. For example, during the early fifties, a period of great creativity at RAND, the Air Force wisely permitted some work that could not be justified by a demonstrable connection to Air Force needs. This attracted to RAND some serious intellectuals who spent some time pursuing their own research interests but who also made direct contributions of great value. Moreover, in several cases, work with only obscure relevance turned out to be of direct value. A case in point is the ground breaking work on water resources done early on in the Economics Division. This work led to the intellectual breakthroughs that formed the conceptual basis for the field of Defense Systems Analysis. There are many other such examples. For this reason it is appropriate that the CDC work program be largely developed by the CDC itself. If serious disagreement about the direction or emphasis develops between the director of the CDC and the RMA working group, a means for resolving the differences needs to be made explicit. However, it is important to recognize that the director must have discretion over some significant specified fraction of the effort. Explicit understandings of this sort can have a very beneficial effect on recruiting and retaining the high quality innovative minds needed for this kind of work.

For creative leadership to formulate and carry out the program, the CDC must have prompt and systematic access, including appropriate security clearances, to pertinent policy documents and data which affect military innovation and the RMA. The Director of the CDC will be made aware of all issues which bear on the performance of the responsibilities of the job in order to develop the broad perspective to structure a creative program of analyses and studies relevant to the impact of new technologies, concepts and doctrine on future warfare.

The professional staff of the CDC will be guided by the highest standards of scientific integrity and competence. Work of the CDC will be distributed regardless of the findings whenever it meets these standards. If there is controversy about the methodology, data or conclusions between the CDC and one of the services, the JCS, or OSD, the study will contain all conflicting positions and be circulated via the appropriate channels. A free, ongoing discourse between CDC professionals the Services, the JCS and OSD will be encouraged. When unclassified research (cleared by security review) which does not contain proprietary information is performed at the CDC, publication in the open literature will be permitted. Staff members will be encouraged to publish their work in the journals of their professions since it is valuable to have the quality of their work subjected to the criticism of their peers in their own professions, and also to enlist the interest of their professions in problems of interest to the CDC. All such publications, of course, will in some way dissociate the Department of Defense and the CDC from their contents, for example, by a statement that the views are those of the author, and not necessarily in accord with the views of the any part of the Department of Defense or the CDC.

The Director of the CDC will be appointed by the Chairman of the Board of Overseers with the approval of the board, and will be acceptable to the Deputy Secretary of Defense.

An important aspect of the operation of the CDC is the participation of military officers who will be assigned to billets, in a joint field activity, reporting to a military officer, who shall carry the title of Deputy Director of the CDC for joint military matters, hereinafter called DDJM. They will receive their work assignments from the Director of the CDC. These officers will be carefully selected by their services and their assignment shall be generally acceptable to the Director of the CDC. Normally their tour of duty with the CDC will last for three years, except for the Senior Fellows, who will normally be assigned for one year. The DDJM shall have the rank of 07 and be carefully selected by the JCS; his assignment shall be subject to the acceptance of the Director of the CDC. He will be ordered to report to the RMA steering group for duty with the CDC, and shall receive his work assignments from the Director, CDC. The Director, CDC may at his option submit to the DDJM letter reports of performance of military officers assigned to the CDC. The Director, CDC, may at his option submit a letter report of the performance of DDJM to the Chairman of the JCS. Assignment to the CDC will be considered as joint duty.

If at some time in the future the mutual interests of the DoD and the University no longer act so as to make this arrangement advantageous, either party shall have the option for an orderly withdrawal. In such a case two years notice should be given if at all possible.

The contractual agreement between the Department of Defense and the University of Southern California will provide full reimbursement within the funds available for this purpose to the University for all expenditures at the CDC and for all direct and properly allocable cost incurred by the contractor in connection with the management of the contract. Since the University may incur expenses prior to the time that the contract is signed, a pre-contract expense clause will be included in the contract. In addition, since, once the contract is signed, the University will be involved in an expenditure of approximately $500,000 per month, an advance in funds or a letter of credit will be needed whereby the University can draw funds immediately as needed, from a local Federal Reserve Bank.

3 January 1996

Secretary of Defense Concept Development Center
and
The Johns Hopkins University

Background

The Johns Hopkins University (JHU), through its Applied Physics Laboratory (APL), is dedicated to the identification and solution of important operational problems by the innovative application of science and technology. JHU/APL's early system-level innovations include variable time fuzes for the Navy and Army, the Terrier, Tartar, and Talos missile systems, and the conceptual and developmental basis for the Aegis system. JHU/APL also pioneered the operational basis of integrated fleet defense, and developed the Cooperative Engagement Capability and Force AAW Coordination Technologies. Other system innovations include the invention of satellite navigation and strategic systems total system reliability assessment, which facilitated such strategic concepts as assured second strike and such structures as the Triad of strategic systems under a centralized STRATCOM. Likewise, the development of terrain matching navigation contributed to the enablement of long-range autonomous precision strike, a concept which is driving US operational planning today and gradually affecting joint structures such as the Joint Air Tasking Center and Joint Task Force component command relationships. APL's trusted-agent status with the government and its history of successfully working closely with sponsors and industry have been key factors in the successful conceptualization as well as realization of these innovations.

Through its history of responding to challenges to undertake new tasks, JHU/APL has developed into a multi-mission laboratory, spanning the areas of Fleet Air Defense, Strike Warfare, Tactical Ballistic Missile Defense, Strategic Systems' Evaluation, Submarine Security, Space Science and Systems, Strategic Communications, Intelligence Assessment, and exploratory activities in Mine Warfare and Information Warfare. JHU/APL has also responded to requests from the Army, Air Force and ARPA to undertake tasks for which it has special capabilities. This broad operational perspective, together with a hands-on knowledge of advanced technology, has enabled JHU/APL to make pioneering contributions. Additionally, through its Nitze School for Advanced International Studies (SAIS), JHU has played a major role in policy and strategic analysis.

JHU and JHU/APL recognize that the Concept Development Center (CDC) must meet its functional mandate for conducting "its own analysis" and serving as a "critical catalyst for innovation" through a willingness to use a "clean sheet of paper" and to look far beyond today while conducting its work. Our capabilities form a foundation which the CDC can use to gain technically sound answers to previously unasked questions, but only the CDC team can evaluate those answers in the context of their mandate.

In keeping with its mission of public service, JHU and JHU/APL wish to participate in the development and operation of the Concept Development Center and to be a full participant in its activities. Our innovative approach to policy and technology issues, familiarity with the needs of the military community, and history of both development and system reengineering all position the JHU family to contribute to the Revolution in Military Affairs in an effective and productive manner.

JHU/APL can offer existing infrastructure that would be critical to the efficient start-up operation of the CDC, including expert technical staff, gaming and simulation facilities, information infrastructure, technical and intelligence libraries, and business and technical support staff. Access to a diverse staff well versed in military affairs is a major feature. JHU's facilities and experienced personnel will allow the CDC to conduct and sponsor its own analyses into new concepts and structures and to serve as a catalyst for innovation in the military. Its extensive record of cooperation with industry will serve as a basis for stimulating innovation in the private sector. Finally, by taking advantage of JHU's existing infrastructure, OSD could achieve initial and effective operation of the CDC in a shortened timeframe.

Discussion

OSD Requirements

A JHU/APL-based CDC would meet the requirements specified by OSD to enhance CDC effectiveness:

- Attractive to civilians and military. JHU/APL is located within convenient commuting distance of Baltimore and Washington. JHU/APL is intimately familiar with both the civilian and uniformed military service communities. We have daily interaction in diverse existing programs and are comfortable with the military establishment in technological, operational, and administrative contexts. JHU's convenient and respected educational programs, including part-time and custom-tailored degree and certificate programs, make us extremely attractive to developing professionals. The intellectual stimulation of a prestigious university community also offers rewards for senior personnel. Excellent meeting and conference facilities are attractive to visitors. Commuting to JHU/APL is generally against major North-of-DC traffic patterns and, thus, easier than alternative commutes.

- Optimal separation from potentially dominant commands. JHU/APL's convenient location between Washington and Baltimore will aid in staffing the CDC. Most civilian and military personnel appropriate for the CDC would already be based in the Washington area, or be suitable for follow-on assignment in the area and thus would not have to relocate to be assigned to CDC or participate in its work. However, JHU/APL is located on its own campus, physically separated from large government complexes. Access to facilities requires advance visitor clearance, which can be readily managed. Conversely, briefings to and meetings with DOD decision-makers are convenient to arrange.

- Proximity to civilian high tech centers. JHU has an extensive research and development establishment of its own when APL is combined with the research infrastructure of the Homewood Campus and Medical Institutions. With the University of Maryland College Park and the University of Maryland Baltimore County nearby and easy access to other Universities, not to mention Goddard Space Flight Center, the National Institute for Standards and Technology, and others, as well as the commercial R&D firms in the Maryland and Virginia suburbs, there is access to an unprecedented range of R&D activity with particular emphasis on information technology capability and resources. JHU resource applications are strengthened through Joint Appointments between University divisions, use of Research Associates, Post-Doctoral appointments, and Senior Engineer/Senior Scientist programs.

- Proximity to complementary military organizations. JHU/APL is within convenient travel distance to the Naval Research Laboratory, Office of Naval Research, Air Force Office of Scientific Research, the Army Research Laboratory (Adelphi), the National Defense University, and Army Medical Command (Ft. Detrick). One day trips to the Tidewater area are feasible (though two days are less stressful).

- Proximity to military intelligence agencies. JHU/APL is within convenient travel distance to all DC-area intelligence agencies, and has ongoing relationships with the CIA, ONI, and NSA. STU-III telephones are readily available and access to the INTELLNET will be available early in 1996.

- Existing administrative and support structures. JHU/APL has the physical plant to locate the CDC in an appropriately configured, identifiably independent setting with convenient access to the rest of APL's facilities. JHU/APL has the administrative infrastructure to support the CDC and has long experience in meeting government needs of all kinds.

- Access to gaming and simulation capabilities. Existing facilities include the Warfare Analysis Laboratory, already familiar to many DOD personnel from Joint Military Assessment activity, the Combat System Evaluation Laboratory, and the Submarine Combat Information Laboratory, among numerous others. Extensive networking facilities and past experience show that the connection of these facilities to each other and to outside Laboratories can create an effective joint warfare modeling and simulation environment. JHU/APL is a node on the Defense Simulation Internet.

- Ability to handle classified material to SCI level. JHU/APL has current SCI facilities and numerous technical and supporting staff with SCI clearances. The security infrastructure is capable of supporting known CDC needs, including secure communications.

Implementation

Implementation options include, but are not limited to, establishing the CDC through existing contract vehicles as a separate program activity, or establishing the CDC through a separate contract, or a combination of both approaches with start-up via an existing contract vehicle with transition to a separate contract as soon as feasible.

If selected to participate in and host the CDC, JHU/APL would immediately provide an Assistant to the CDC Director to coordinate the interface with JHU/APL infrastructure and management. This would include 1) use of the Human Resources Department to facilitate recruitment and hiring of permanent civilian staff, 2) use of the Administrative Services Department to provide security infrastructure and documentation, 3) use of the Naval Warfare Analysis Department to facilitate connection to the intelligence community, and 4) use of Business and Information Systems Department to develop necessary financial systems and subcontracting vehicles for CDC-funded outside studies, to provide necessary network infrastructure, to provide short-term support for CDC business and data processing needs, and to establish procurement support for dedicated CDC equipment. Thus, the CDC Director will be able to focus on senior civilian and military staff selection and recruitment, as well as identification of initial study topics and methods.

A small number of senior APL staff members, experienced in gaming/simulations or assessment efforts, could be made available to the CDC on term appointments to help initiate the CDC's efforts as permanent staff are assembled. Of course, APL staff would continue to be available on a flexible basis to participate in particular studies, on red teams, or special efforts. CDC personnel would have access to informal consultation with APL's many technology experts. Senior SAIS staff would also be likely to be available to the CDC for consultation, or for term and part-time appointments, given the nature of their on-going activities with the Office of Net Assessment. Further, SAIS graduate students might participate in short-term studies where specialized knowledge of international affairs would benefit CDC.

Start-up within an existing contract vehicle is the fastest path to execution requiring a cost proposal, endorsement, and basic contract funding modification, a process currently taking three to twenty weeks (the first option noted above). Brought aboard as a separately contracted entity (the second option noted above), the CDC infrastructure could be in place and supporting the activities of on-board staff within days of the execution of a contractual vehicle with JHU (though contracting can take months).

An effective approach would include not only much of the JHU family but also other entities, based upon their proven support to similar activities across the DOD spectrum. Additionally, the utility of interfacing with other potentially related DOD activities (e.g., the CMC's Warfighting Laboratory, the U.S. Army Warfighting Laboratories, the Joint Warfighting Center, etc.) is recognized and would have a place in the implementation strategy. Including appropriate industry participants should be a "first on the agenda" item for CDC operations. JHU/APL has extensive experience at the government/industry interface and has established a solid reputation for objectivity and service to government. JHU/APL would be

effective in facilitating this critical interaction with industry. The ultimate success of CDC rests on building a robust and trusting relationship with industry since much of the future revolution in military affairs will be facilitated and driven by applications of commercial technology.

Costs

JHU and JHU/APL's operating costs are competitive with other government and non-profit organizations. Rough Order-of-Magnitude cost estimates for start-up (one year costs without a building) and for operations (less industry participation but including external study costs) on an annual basis do not appear to exceed $25M and $15M, respectively for a modern networked 55 billet operation (1/3rd civilian and 2/3rds military). Detailed cost estimates could be provided if DOD interest in JHU and JHU/APL participation merits.

Conclusion

A JHU/APL site for and role in the Concept Development Center meets the requirements anticipated by OSD. JHU/APL could achieve an initial operating capability for the CDC very close to OSD's desired time line. Finally, JHU/APL's unique perspective, facilities, and staff, and association with the University at large provides an excellent opportunity to maximize the effectiveness of the CDC in meeting OSD's needs for new concepts and a catalyst for innovation.

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JWFC-DOC 20 December 1995

MEMORANDUM FOR DIRECTOR OF NET ASSESSMENT

Subject: RMA Concept Development Center

I read your proposal for an RMA Concept Development Center (CDC) with great interest and agree that the joint warfighting community needs an established, holistic process that stimulates long-term conceptual and technological innovation. We have been investigating related ideas over the past few months as we have been considering how to transform the Chairman's *Joint Vision 2010* into changes in doctrine, materiel, organizations, training, and leader development programs that are relevant to 2010 joint force operations. Our approaches seem similar, but with a different timeframe of focus.

We have been struggling with the issue of how to implement the Chairman's vision. We believe that successful implementation requires a way to focus and integrate experimentation (such as Advanced Concept Technology Demonstrations), assessment (such as the JWCA and various modeling and simulation efforts), materiel development, and force design. At the center of our approach is the development of an overarching joint future operations concept. It would provide an intellectual foundation for 2010 operations by describing an operational framework within which to explore and evaluate various combinations of potential joint and Service capabilities. We are presently working on a draft of this concept and have enclosed the chapter outline for your information.

We are concerned that there is no current process within the DoD community that adequately *integrates* and *focuses* the various conceptual, assessment, experimentation, force design, and materiel development components toward a common goal. Without this process, I think our efforts—and those of a CDC—will not realize an effective return on our investment. The basic functions you ascribe to the CDC—analyzing new concepts and serving as a catalyst for innovation—are vital to the process mentioned above. Not only could they serve the long term, but they are essential as well to mid-term conceptual and analytical work and near-term application of the results. However, I am somewhat skeptical about creating a new center with significant resources and a long-term charter until a consensual process has been agreed to by our civilian and military leadership that helps manage change. There needs to be a way for near- and long-term conceptual and analytical efforts to enable the right decisions that will help prepare us for future joint warfare. Top-level endorsement and consensus is essential to effectively implement broad changes.

Enclosure 4

We agree with your thoughts that a CDC could stimulate and focus innovation among private industry, academic institutions, think tanks, the CINCs and Services, and the intelligence community. The Future Threat Studies Group and Security Group you mention are other initiatives that could provide an invaluable service in assessing long-term challenges to our national security. These are relevant roles perhaps best fulfilled by a CDC-type organization sponsored by the Secretariat.

If you eventually establish a CDC, we think it should have a close, formal association with the JWFC. Our functional scope and geographical reach give the Center a good baseline perspective on a wide variety of training and doctrine issues of concern to the CINCs. JWFC, for example, supports all combatant commanders in their training and exercise programs. Moreover, the Center is the DoD Program Element Monitor (PEM) and program advocate for the Joint Simulation System (JSIMS). In addition to forming the future simulation core for training joint task forces, JSIMS will support analysis, test and evaluation, and doctrine development. In the doctrine arena, JWFC writes and revises selected joint doctrine and assesses approved doctrine publications. Finally, the Center is supporting *Joint Vision 2010* implementation by developing a joint future operations concept and by advocating institutionalizing a process for managing change within the joint community. Our role may continue to broaden depending on decisions related to forming a joint training, exercise, and doctrine command—a suggestion by last summer's Commission on Roles and Missions.

We believe the process of stimulating innovation and managing resulting change requires close cooperation, integration, and the right balance of effort between the DoD Staff, the Joint Staff, the combatant commands, and a variety of supporting players. The CDC could be one of many potential components. However, we are not comfortable that the current system can respond effectively to even mid-term initiatives, much less to major innovations focused in the 20-30 year CDC period. I would caution against committing significant resources until we are confident that we have solved this problem. We would welcome an opportunity to meet with your OSD working group to help define a viable process for accommodating future change before you present your recommendations to Mr. Kaminski.

Joseph J. Redden

JOSEPH J. REDDEN
Major General, USAF
Commander

Enclosure

Reference:
* Office of the Secretary Defense, Director of Net Assessment Memo, 30 Nov 95.