BRAC 2005
Industrial Joint Cross-Service Group (IJCSG)

Meeting Minutes of September 5, 2003

Mr. Michael Wynne, Acting Under Secretary of Defense for Acquisition, Technology and Logistics, chaired the meeting. The list of attendees is at Attachment 1.

The Chairman opened the third Industrial JCSG meeting with introductions. Prior to receiving the subgroup approach to capacity analysis presentations, the Chairman handed out a chart used by the Medical JCSG during their briefing to the Infrastructure Steering Group on August 29, 2003. The chart (Attachment 2) portrays how their capacity analysis fits within their overall BRAC process to arrive at closure and realignment recommendations. The Chairman requested the Industrial JCSG modify this chart to fit its needs and include it in their approach to capacity analysis presentation.

Mr. Ron Orr, Principal Deputy Assistant Secretary of the Air Force (Installations, Environment and Logistics) presented a briefing on the Maintenance subgroup's approach to capacity analysis. A copy of the briefing is at Attachment 3. Prior to beginning his briefing, he mentioned that too many people were attending some of the BRAC subgroup meetings. Even though these personnel had signed non-disclosure agreements, he said we need to consider how many personnel have a need to know related to BRAC issues. The group's conclusion was that within the IJCSG, the principals will control the attendance of all personnel from each of their Military Services.

Mr. Orr proposed several changes to the list of functions previously approved by the Secretary. The first revision was to only include fixed site intermediate level maintenance, rather than addressing the mobility function which has no organic facility infrastructure. The second revision was to formally include government owned-contractor operated (GOCO) facilities. Even though the primary purpose of most GOCOs is production, significant maintenance is also performed at these facilities. Mr. Orr said that we need to identify where this work is performed and what type of maintenance is done at each location. The Chairman agreed, and said that the data call should collect sufficient information to review GOCOs.

Mr. Orr proposed using the standard capacity methodology used by the Department which measures capacity in direct labor man hours. This is based on a single shift, 40 hour workweek. The Chairman said that we should consider increasing the number of shifts in the capacity assessment, such as to one and a half shifts, if appropriate. Mr. Orr also proposed developing a Maximum Potential Capacity that could be sustained by adding workstations and personnel. Surge workload, which is based on wartime

requirements, could exceed Maximum Potential Capacity through the use of actions such as employing overtime and using supervisors.

The Maintenance subgroup proposed that "environmental capacity" be considered. This includes air quality credit requirements and water availability. The Chairman mentioned that stable power availability is sometimes also a related constraint on capacity. The OSD BRAC Director, Pete Potochney, said that the term "environmental" might be confused with its use in other parts of the BRAC process and that a new name for these capacity constraints should be identified and used.

The Maintenance Subgroup proposed collecting Plant Replacement Value (PRV) during the capacity process. The Chairman said that the group should be careful not to let sunk costs control decisions. Also, intermediate maintenance would follow the same capacity process as depot maintenance. Mr. Orr indicated that statutory processes concerning Core and 50-50 must be considered.

RADM Klemm presented a briefing on their approach to the Shipyard Overhaul and Repair subgroup capacity analysis. A copy of the briefing is at Attachment 4. He proposed to change the name of the subgroup to Ship Overhaul and Repair to allow the inclusion of ship intermediate maintenance that is not performed in shipyards. If approved, this would transfer this workload from the Maintenance subgroup to this subgroup.

The ship maintenance capacity analysis would consider three groups: carriers and other large deck ships, submarines, and other surface ships and craft. The last group is primarily maintained in private sector facilities. Demand would be assessed over a 5 year period. Mr. Potochney said that current demand should be based on the most recent actual data available and that the overall analysis must be based on a 20-year future assessment. RADM Klemm asked about facilities that might be needed past 2011 but not for the complete 20 year period. Mr. Orr suggested considering "divesting" the facility through the BRAC process, but retaining the use of it through an alternative approach, such as privatization-in-place.

RADM Klemm said that capacity analysis must include personnel, unique needs, and location. He proposed using several matrices which identify the skill sets, facilities, and equipment needed for specific work. In nuclear shipyard maintenance, the ability to accommodate surge was limited by both available skilled personnel and facilities. Additionally, RADM Klemm explained the Navy's One Shipyard concept, which considers capacity in both the public and some private shipyards.

MG "Hamp" McManus, Commander, Operations Support Command, presented a briefing on the approach to the Ammunition and Armaments subgroup capacity analysis.

A copy is at Attachment 5. [redacted] Mr. Wynne emphasized that they needed to continue to evaluate retail locations for these weapons. [redacted] The subgroup proposed using existing tools to perform the capacity analysis. The process will include an analysis of GOCO facilities to size them to what is needed. The subgroup is still reviewing how to evaluate surge requirements.

Mr. Potochney said that the subgroups' capacity reports need to tie metrics to specific attributes, and attributes to specific functions. He also said the definition of surge capacity must be fully understood; the Ammunition and Armaments sub-group acknowledged in their report that more work is needed in this area. Finally, Mr. Potochney reminded the group that they will make a consolidated capacity presentation to the ISG on September 19, 2003, with their report needed by September 12, 2003 as the read-ahead. Mr. Bob Mason, the IJCSG Executive Secretary, and his staff will consolidate the report and briefing, with assistance from the OSD BRAC Office.

Approved: _____
Mr. Michael Wynne
Chairman, Industrial Joint Cross-Service Group

Attachments:

1. List of attendees
2. Medical JCSG Chart
3. Maintenance Subgroup Capacity Brief
4. Shipyard Overhaul and Repair Subgroup Capacity Brief
5. Ammunition and Armament Subgroup Capacity Brief

Industrial JCSG Meeting
September 5, 2003

Attendees

Members:

- Michael Wynne, Acting Undersecretary of Defense for Acquisition, Technology and Logistics
- MG "Hamp" McManus, Commander, Operations Support Command
- RADM Bill Klemm, Deputy Commander, Maintenance and I&D Ops, Naval Sea Systems Command
- Ron Orr, Principal Deputy Assistant Secretary of the Air Force (Installations, Environment & Logistics)

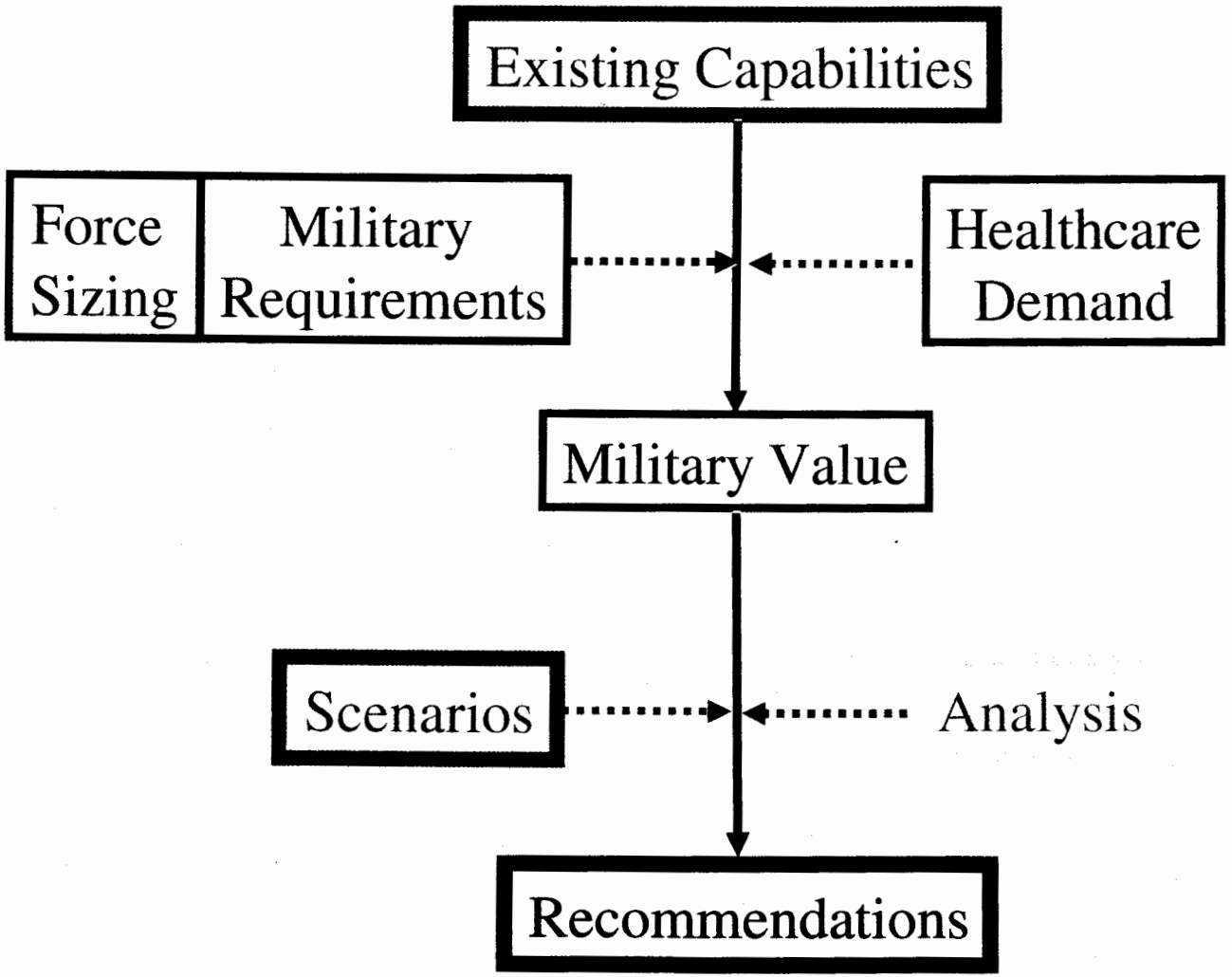
Alternates:

- Susan Kinney, Deputy Director, Logistics Plans, Policy and Strategic Mobility Division, HQMC
- Col Mike Stine, JCS, Logistics (J4)

Others:

- Peter Potochney, Director OSD BRAC Office
- Robert Mason, OSD AT&L
- Jay Berry, OSD AT&L
- Mark VanGilst, HQ USAF/ILMM
- Maj. Stephen Dubois, HQMC I&L
- Steve Krum, NAVSEA
- CDR Tim Wilkins, NAVSEA
- LTC Rich Wiersema, OSD AT&L
- John Desiderio, OSD BRAC Office
- Alex Yellin, OSD BRAC Office
- Tony Melita, OSD AT&L
- Willie Smith, HQ AFSC
- Catherine Schneiter, Do DIG
- Frank O'Rourke, HQ DLA
- LtCol Walt Eady, JCS/J4

Battle Plan



DCN: 11276

Industrial JCSG
Maintenance Subgroup
Capacity Analysis

29 Aug 03

Draft Deliberative Document – For Discussion Purpose Only

Do Not Release Under FOIA

Overview

- Organization
- Functions
- Capacity Analysis Methodology
- Issues Impacting Analysis

Organization
Industrial Joint Cross Service Group

Mr. Bob Mason
ADUSD(MPP&R)
Executive Secretary

IJCSG
Hon. Michael Wynne

USA: MG Hamp McManus
USN: RADM Bill Klemm
USMC: Ms. Sue Kinney
USAF: Mr. Ron Orr
OJCS: BG Hank Taylor

Ammunition & Armament	Maintenance	Shipyards
MG Hamp McManus	Mr. Ron Orr	RADM Bill Klemm

Chair AF: Mr. Mark Van Gilst
USA: COL Kirk Foster
USN: Mr. Fred Tillack
USMC: Ms. Debbie Petrasek
DLA: Mr. George Kingsly (Ctr)
DoDIG: Ms. Steve Schaefer
OJCS: Lt Col Walt Eady
ODUSD: Mr John Desidero

Military	Civilian	Contractor
3	6	2

Personnel Currently Working JCSG Matters

Function to be Analyzed

- Maintenance: from two major attributes based on type or level of the maintenance performed
  - Depot maintenance
  - Combat field support (intermediate level)

Refinement to SecDef Approved Functions

- GOCO Infrastructure
  - Industrial JCSG is primary and will work the other JCSGs
  - Review and close/realign if appropriate

Capacity Analysis Methodology

- **Function:** Maintenance
- **Attributes:** Depot-Level Maintenance (Aircraft, Ground Vehicles, etc.)
- **Metrics of Attributes:** Workload, Capacity, Environmental
- **How Capacity Measured:**
  - DoDD 4151.18H Depot Maintenance Capacity and Utilization Measurement Handbook by commodity
    - Capacity Index, Capacity Utilization Index, Maximum Potential Capacity, etc.
  - Workload by commodity: Total Workload, Surge, Directed Workload, etc.
  - Environmental Capacity: Air permits; process constraints, etc.
  - Other Consideration
    - Plant Replacement Value: Facilities and Equipment

Capacity Analysis Methodology

- **Function:** Maintenance
- **Attributes:** Combat (I-level) Field Support (Non-deployable, Fixed Infrastructure)
- **Metrics of Attributes:** Workload, Capacity, Environmental
- **How Capacity Measured:**
  - DoDD 4151.18H Depot Maintenance Capacity and Utilization Measurement Handbook by commodity
    - Capacity Index, Capacity Utilization Index, Maximum Potential Capacity, etc.
  - Workload by commodity: Total Workload, Surge, Directed Workload, etc.
  - Environmental Capacity: Air permits; process constraints, etc.
  - Other Consideration
    - Plant Replacement Value: Facilities and Equipment

Issues Impacting Analysis

- Issues which may constrain/limit scenario and alternative development
  - DoD required to maintain core capabilities that are government-owned and operated (including government-owned personnel, equipment, and facilities), (Title 10 USC §2464 – Core Law)
  - 50% limitation on contracting for depot level maintenance for each Military Department and Defense Agency, (Title 10 USC §2466 – 50/50 Law)
- Options: Develop scenario/alternatives within the legal constraints; Develop scenario/alternatives assuming no legal constraints
- Recommendation: Perform configuration analysis and scenario development based on legal position

Issues Impacting Analysis

- Issues which may effect implementation of recommendations
  - Public/Private Partnering agreements due to contractual partnership liabilities at the realigned or closed locations (Title 10 USC §2474 and §2563),
  - Source Selection requires the use of competitive procedures when moving workload from the public sector to the private sector (Title 10 USC §2469 - $3M Law)
  - Financial Regulations and restrictions due to contractual liabilities from selling items or services to non-DoD entities at the realigned or closed locations (Title 10 USC §2208J).
- Options: Develop scenario/alternatives within the legal constraints; Develop scenario/alternatives assuming no legal constraints
- Recommendation: Perform configuration analysis and scenario development based on legal position

Industrial JCSG Capacity Analysis

Briefing to the

Infrastructure Steering Group

19 September 2003

Overview

- Organization
- Functions
- Capacity Analysis Methodology
- Issues Impacting Analysis

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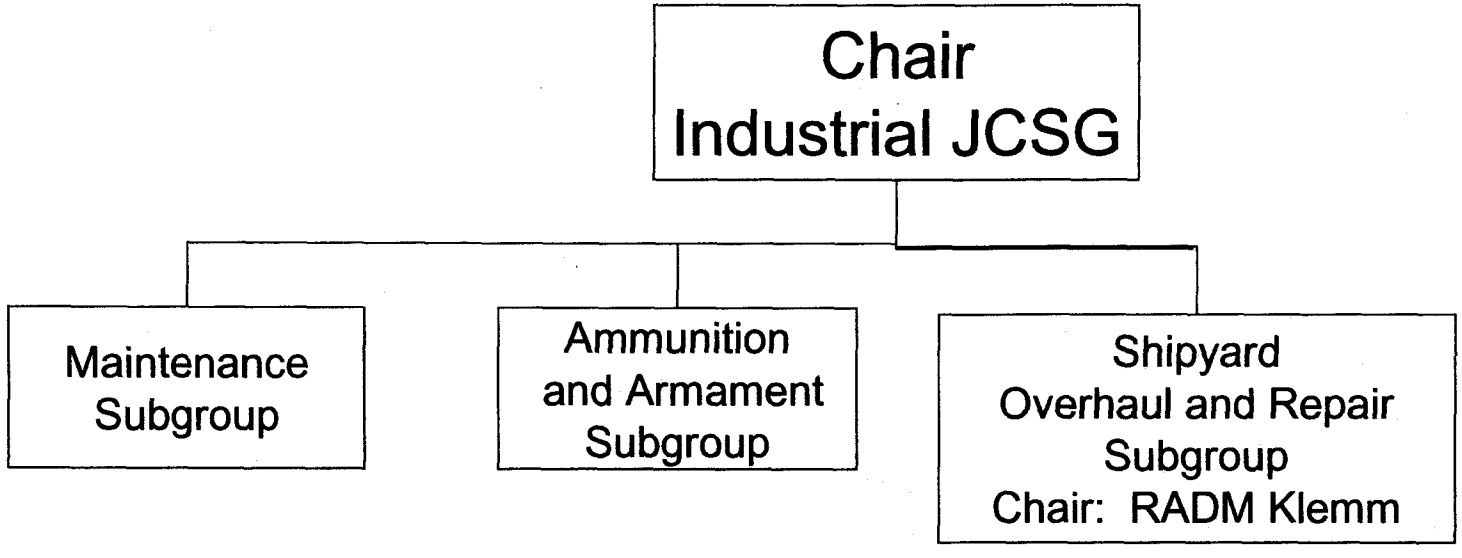
Organization



Personnel Currently Working JCSG Matters
(Numbers below includes full and part time)

Military	Civilian	Contractor
1	5	3

Functions to be Analyzed

- Shipyard Overhaul and Repair

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Refinements to SecDef Approved Functions

- Revise "Shipyard" to "Ship" in the function title for clarity, because the scope of this function should include Depot-Level Ship Overhaul, Repair, and Nuclear Refueling, and Intermediate-Level Ship Maintenance and Repair.

Capacity Analysis Methodology

- Function: Ship Overhaul and Repair
- Ship Types:
  - Aircraft Carriers and other Large Deck Ships
  - Submarines
  - Other Surface Ships and Craft

Please see matrix portraying methodology.

Capacity Analysis Methodology: Overview

Capacity Requirement (Demand)

- Force Structure and Readiness Requirement
  - Platform numbers and availability
  - Peacetime Training, Deployment & Scheduled Maintenance Plan
  - Surge Factors: Extended Deployment, Unplanned Deployment, Battle Damage
- Overhaul, Maintenance & Repair Cycles & Scope Required ("I" & "D" Levels)
  - By platform type or class (i.e. "product")
  - "Peacetime" and "Surge" demands
- Resulting Resource Demands (Skilled Labor, Equipment & Facilities)
  - By O/H,M&R and Fleet Support element/product
  - Critical Capabilities (e.g., Platform-Specific, etc.)
  - Demand phasing or "Duty Cycle"
  - Essential "Core" O/H, M & R Capabilities

Current Available Capacity (Supply)

- "Capability" Encompasses Facilities, Skilled Labor & Equipment
- Determine Current Resources Available
  - By Maintenance & Repair and Fleet Support functional element (I & D)
  - Platform - Specific Categories
  - Aggregate NSY-Sourced Capacities for "Core" and other capabilities Necessary for ship O/H, M&R and Fleet Support
  - Alternate-Source Capabilities & Capacities
- Determine Ship O/H, M & R Capability Gap Based on Requirements & Current Capacities
  - At-Risk Critical Capabilities
  - Reserve Capacities

This is a notional model for collecting essential information relative to O/H, Maint. Repair & Fleet Support that will readily assist in characterizing both current capability/capacity and Fleet force level and readiness requirements.

- Ensures parametric consistency for Capability/Capacity-Requirements comparison
- Encompasses both Intermediate- and Depot- Level Maint. & Repair and Fleet Support

Capacity Analysis Methodology

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Notional Data Collection Matrix (Skilled Labor)

Platform	O/H, Maintenance, Repair & Fleet Support Element														
	Structural	Mechanical (Examples Below)								Electrical	Combat Control	Guns & Launchers	Radar, EW & Elex	...	Other Systems
		Valves		Pumps		Piping		Other							
		Nuc	Non-Nuc	Nuc	Non-Nuc	Nuc	Non-Nuc	Nuc	Non-Nuc						
Large Deck															
CVN/CV															
LHA/LHD															
⋮															
Submarine															
SSN															
688/688I															
⋮															
SSBN															
SSGN															
MTS															
Other Surface															
CG/DDG															
⋮															
Amphibs															
Non-Combatant															
Land-Based Facilities															
⋮															

Description of Element Details

- Skilled Labor (incl special certifications)
- Includes Engineering, Planning & Artisan Trades
- Includes Skills & Knowledge "Pipeline"

Metrics -Skilled Labor by Category

- **Requirements Call - Trades & Engr'g**
  - Full Performance level - DLH
- **Capacity Call - Trades & Engr'g**
  - Apprentice - "Pipeline"- DLH
  - Journeyman - Full Performance - DLH
  - Post Journeyman - Senior Experts - DLH

Specify the Work Elements Consistent with Standard WBS That Characterize O/H, Maintenance, Repair & Fleet Support ***Skilled Labor,*** *in terms of Artisan Trades, Planning, Engineering & Management*

- Cells will be populated with data as appropriate.

Capacity Analysis Methodology

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Notional Data Collection Matrix (Facilities & Equipment)

Equipment Capabilities	O/H, Maintenance, Repair & Fleet Support Facilities														
	Dry Docks	Shops								Nuclear Support Facilities	Piers / Moorage Space	Engineering Spaces	Lay-down Space	...	Other
		Electrical	Ship Fitting	Machine	Pipe Fitting	Foundry	.....	Periscopes	Calibration						
Lilfting Capability															
Portal Cranes															
Fixed Cranes															
Mobile Cranes															
Rail Access															
Environmental Permits															
Non-Nuclear															
Nuclear															
Heavy Industrial Capability															
Light Industrial Capabnility															
Product Testing															
⋮															
Other															

- Cells will be populated with data as appropriate.

Facility & Equipment Metrics

- Current Utilization - DLH
  - ✓ Peacetime
  - ✓ Surge
- Maximum Facility Capacity - DLH
- Key Specifications
  - ✓ Work-piece Weight (max)
  - ✓ Work-piece Dimensions (max)
  - ✓ Shop Space - KSF
  - ✓ Expansion Potential - KSF

Note: Capacity and Utilization to Use Definitions as specified in DOD 4151.18 - H as modified

Capacity Analysis Methodology (continued)

- Capacity measurement plans and assumptions:
  - Multiple metrics will be used (see previous slides); eight notional metrics.
  - Principal characteristics:
    - Skilled Manpower
    - Facilities
    - Support Equipment
  - Apply DoD 4151.18H Depot Maintenance Capacity and Utilization Measurement Handbook, including capacity standards (one shift per day, eight hours per day, etc.) as modified

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Capacity Analysis Methodology (continued)

- Maximum potential capacity for Depots, e.g., Shipyards, is typically limited by Skilled Manpower, because of unique training/experience requirements.
- Surge is dictated by emergent deployments or ship repair requirements. Shipyards are normally loaded to their maximum workforce capacity; therefore, surge capability is limited to the use of overtime and delaying previously planned work.

Issues Impacting Analysis

- Maximum Potential Capacity Definition
- Title 10 USC 2464 - Core Law
- Title 10 USC 2466 - 50/50 Law
- Title 10 USC 2469 - Public/Private Competitions ($3 million rule)
- Title 10 USC 2474 - Centers of Industrial and Technical Excellence and Partnerships
- Title 10 USC 2563 - Potential Liabilities on Outside-of-DoD Sales

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Close Hold

Ammunition & Armaments Industrial JCSG Sub-group Capacity Analysis Approach

MG WADE H. MCMANUS, JR.
Commanding General
Army Field Support Command
DSN 793-5111

On the Line

Overview

- ✓ Organization
- ✓ Functions
- ✓ Capacity Analysis Methodology
- ✓ Issues Impacting Analysis

Capacity Analysis Methodology

- ✓ **Function example: Large ammunition and armaments**
  - ➢ **Direct & Indirect**
- ✓ **Function attributes:**
  - ➢ **Production Capacity**
  - ➢ **Demilitarization**
  - ➢ **Manufacturing Flexibility**
  - ➢ **Enterprise Architecture**
  - ➢ **Infrastructure Condition/Readiness**
  - ➢ **Environmental**
  - ➢ **Safety (Explosives, Environmental, Occupational)**

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Capacity Analysis Methodology

- ✓ **Function Attributes (continued):**
  - ➢ Renovation/Rework/Surveillance
  - ➢ Deployment Network
  - ➢ Specialized Capabilities
- ✓ **Attribute metrics:**
  - ➢ Square footage and acreage
  - ➢ Number of safety waivers
  - ➢ Out-loading capability
  - ➢ Age of facility
  - ➢ Number and types of commodities produced/renovated/reworked
  - ➢ Equipment uptime

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Capacity Analysis Methodology

- ✓ **Attribute Metrics (continued):**
  - Available vs. utilized space
  - Maximum vs. current throughput capability
  - Explosive vs. inert storage capability
  - Percent of workforce with specialized skills
  - Joint customer mission supported
  - Military unique processes
  - Industrial manufacturing certification levels
  - Buildable acreage
  - Encroachment

DCN: 11276

Capacity Analysis Methodology

- ✓ **Second function example: Propellants/ Explosives:**
  - ➢ **Propellants and explosives manufacturing**
- ✓ **Function attributes:**
  - ➢ **Same as 1st example:**
    - **Availability of natural resources**
- ✓ **Attribute metrics:**
  - ➢ **Same as 1st example**

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Capacity Analysis Methodology

✓Capacity Measurement Description:

- ➢Will synthesize ~~three~~ the tools to conduct this analysis:
  - Deployment network/distribution analysis
  - DOD 4151.18H *Depot Maintenance Capacity & Utilization Measurement Handbook*
  - NAVSEA infrastructure analysis model
  - DoD 5000.60 Defense Industrial Capabilities Assessments
  - DoD 5000.60-H Assessing Defense Industrial Capabilities

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Issues Impacting Analysis

- ✓ Federal Property and Administrative Services Act of 1949
- ✓ Section 317 of Public Law 99-661(Crane-McAlester Act)
- ✓ Title 10 USC § 2474 CITE and Partnerships
- ✓ Title 10 USC § 2563(Sales Outside DOD)
- ✓ Lack production base planning policy that incorporates guidance on strategic supply chain

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DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
3030 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-3030

SEP 16 2003

MEMORANDUM FOR ACTING UNDER SECRETARY OF DEFENSE
(ACQUISITION, TECHNOLOGY AND LOGISTICS)

SUBJECT: Technical Joint Cross Service Group (TJCSG) Report

As requested by your July 16, 2003 memorandum, the TJCSG has developed an approach for conducting a capacity analysis of the technical infrastructure for BRAC 2005. The attached report and briefing slides are submitted as a read ahead for the September 19, 2003 briefing to the ISG. I anticipate that the briefing slides that I use on Friday may be slightly different, as they are refined over the next several days.

We believe that this approach is comprehensive and provides a mechanism to fully measure the technical capacity of the Department of Defense. This process will measure both current workload plus surge requirements. Additionally, this analysis incorporates and considers intellectual capacity, which is critical to maintaining technological superiority for our warfighters.

The TJCSG is continuing to develop, refine and integrate our final set of questions for the capacity data call. The attached report provides representative questions for consideration. The final set of TJCSG capacity data call questions will be submitted to the OSD BRAC office by September 23, 2003.

Ronald M. Sega

TECHNICAL
JOINT CROSS SERVICE GROUP

Capacity Analysis Report

Section 1: Introduction

This report responds to the two Memoranda from the Acting Under Secretary of Defense (Acquisition, Technology and Logistics) USD (AT&L) as the Chairman of the Infrastructure Steering Group (ISG), dated July 16, 2003and. August 6, 2003 This report, from the Technical JCSG to the Infrastructure Steering Group (ISG), summarizes our proposed approach for conducting technical capacity analysis. The report provides:

- definition of technical functions,
- metrics to measure current DoD owned throughput capacity for technical functions (as well a defining their maximum potential capacity),
- definition of surge capacity in technical functions and a method for determining surge capacity requirements.

Definition of Technical Functions

The Technical JCSG capacity analysis assumes the Department's entire technical capability can be captured by three functional areas:

- Research (Science & Technology, S&T)
- Development & Acquisition (D&A)
- Test & Evaluation (T&E)

The following functions and sub functions will be analyzed within the Technical Joint Cross Service Group (TJCSG) as defined in the Memorandum to the Chairman of the ISG, dated 1 April 03:

a. Research Function

1. *Basic Research* sub function
    a. Supports research that produces new knowledge in a scientific or technology area of interest to the military.
    b. Basic research may lead to applied research & advanced technology developments which will improve military functional capabilities.
    c. A majority of basic research awards go to universities.

2. *Exploratory Development* sub function
    a. Applied research into new technologies for specific military applications or further development of existing technology for new military applications.
    b. Systematic study to understand the means to meet a recognized and specific national security requirement.
    c. It may include design, development, and improvement of prototypes and new processes to meet general mission area requirements.

3. *Advanced Development* sub function
    a. Advanced development is technology development that supports larger scale hardware development, integration, and experiments that can demonstrate capability in more operationally realistic settings.
    b. Development of subsystems or components and efforts to integrate them into system prototypes for field experiments and/or tests in a simulated environment.
    c. Projects in this category have a direct relevance to identified military needs.
    d. Projects in this category do not necessarily lead to subsequent development or procurement phases.

b. Development & Acquisition Function

1. *System Development and Demonstration* sub function
    a. System specific efforts that help expedite technology transition from the laboratory to operational use.
    b. Emphasis is on proving component and subsystem maturity prior to integration in major and complex systems and may involve risk reduction initiatives.
2. *System Modifications* sub function
    a. Improve product affordability, system reliability, maintainability, and supportability via technology refreshment
3. *Experimentation and Concept Demonstration* sub function
    a. Exploit mature and maturing technologies to solve military problems.
4. *Product/In-Service Life Cycle Support* sub function
    a. Engineering support for system peculiar capabilities in order to conduct check-out of the system and/or subsystem after they have undergone a modification, upgrade or improvement.

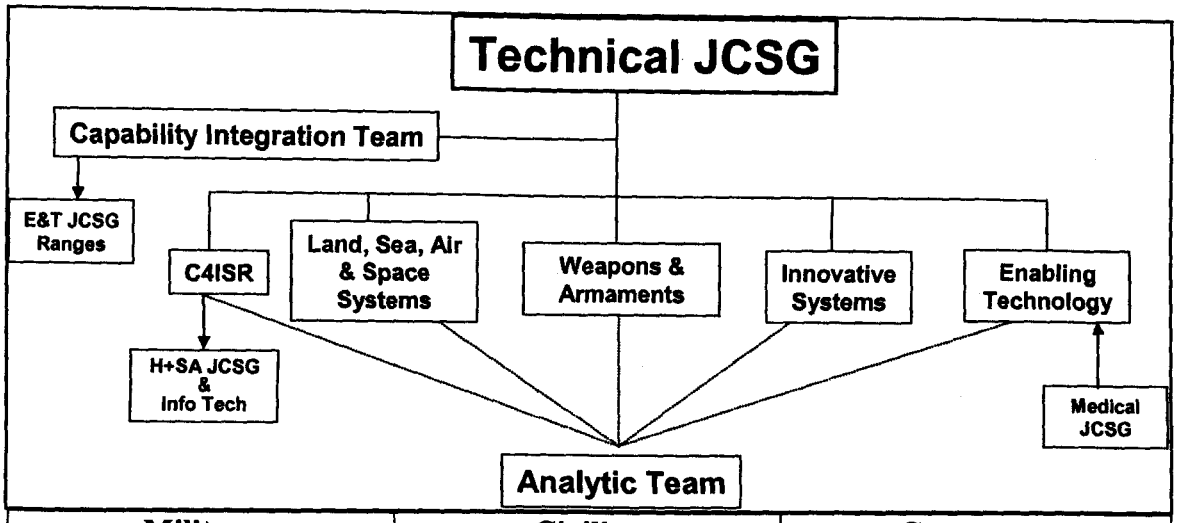
c. Test and Evaluation Function

1. *Developmental Test and Evaluation (DT&E)* sub function
    a. Evaluates technical performance and safety
2. *Operational Test and Evaluation (OT&E)* sub function
    a. Evaluate operational effectiveness and suitability under realistic operational conditions including combat
    b. Determine thresholds in the approved Capability Performance Document
    c. Determine if critical operational issues have been satisfied and improve combat operations.

These functions are most typically done at laboratories; warfare centers; research, development, and engineering centers; test ranges; acquisition product centers, etc.

Organizational Structure

Figure 1 depicts the organizational structure, and includes the interdependencies with other joint cross service groups.



Military	Civilian	Contractor
15 (5 FTE)	70 (3 FTE)	10 (1 FTE)

Figure 1: TJCSG Organizational Structure

Dr. Ron Sega, Director, Defense Research and Engineering (DDR&E) chairs the TJCSG.

Other members include:

- Brig Gen William Catto (Commander Marine Corps Systems Command)
- RADM Jay Cohen (Chief of Naval Research)
- Dr. John Foulkes (Director Army Test and Evaluation Management Agency)
- Dr. J. Daniel Stewart (Executive Director, Air Force Materiel Command)
- Mr. John Erb (Deputy Director for Strategic Logistics, J-4, Joint Staff)

Five Technical Working Groups (WG) represented by SES/General Officers from each of Five Technical Capabilities Areas: C4ISR; Land, Sea, Air, and Space Systems; Weapons and Armaments; Innovative Systems; and Enabling Technologies. Each technical WG will examine capabilities in their assigned area across the three functions (research, development and acquisition, and test and evaluation).

An Analytical Team (AT) will analyze the data for all technical WGs and the TJCSG, as required, making the results available to the TJCSG members and

members of all the technical WGs. The Analytic Team may develop common approaches and tools for each Technical Working Group to use to analyze the data. Each Technical Working Group will provide the results of the analysis to the TJCSG for final approval.

The Capabilities Integration Team (CIT) will integrate and reconcile the products of the Technical Working Groups in collaboration with the TJCSG.

The resources (funding and personnel) for the first six months (March to August, 2003) of the TJCSG have been provided by contributions from the Army, Navy, Air Force and various OSD organizations involved on an as needed basis. The Navy has offered to provide space for the duration of BRAC 2005 where deliberative data can be securely stored and analyzed. The approach for resources over the next six months (through Feb 2004) will continue to be provided by the components on an as needed basis. To date, over 100 people (many at the SES/GO level) are working in some capacity on the various groups in the TJCSG. We estimate the full time equivalence (FTE) of these 100 people is approximately nine (9). We estimate the FTE will remain near nine for the next six months. Once the capacity data is received from the Services, we estimate the total FTE through May 2005 will be twenty five (25).

Refinements Based on SECDEF Approval

The TJCSG acknowledges responsibility to work collaboratively to determine the technical capacity for the following capabilities:

Support from the TJCSG for a Ranges Subgroup under the Education & Training (E&T) JCSG to address all range technical functions, including testing, training, and collective training. The statement in our April 1, 2003 report that the test and evaluation function "includes ranges and facilities whose primary mission is Test and Evaluation" has been removed. The ranges whose primary mission is test and evaluation will be reported in collaboration with the E&T JCSG.

The TJCSG has overall responsibility for determining the capacity to develop information technology. The Headquarters and Support Activities (H&SA) JCSG has responsibility to measure the overall capacity of communications from a base-level perspective. The TJCSG will work closely with the H&SA JCSG through its Defense Information Systems Agency (DISA) representative.

The capacity for medical and dental aspects of human systems research will be measured by the TJCSG with support from the Medical JCSG. A member of a Medical JCSG working group will be a member of the Enabling Technology Technical Working Group addressing medical and dental technology.

SECTION 2: Approach to Capacity Analysis

We have reduced our military forces over the past fifteen years (beginning with BRAC 1988). This reduction was made possible, in part, because modern technology enables our forces to perform their missions more effectively and efficiently. The TJCSG believes the technical capacity needed by the DoD is critical to securing an effective force structure; however, there is no defined relation between technical capacity and force structure. The purpose and product of the technical functions are to ensure a continuing stream of technologically superior capabilities and systems that are applied so as to enable US forces to have superior operational capabilities.

Assumptions Used for Developing the Attributes and Metrics

The TJCSG begins with the assumption that the three technical functions and their sub functions support five technical capability areas:

1. Air, Land, Sea & Space Systems
2. Weapons & Armaments
3. Command, Control, Communications, Computers, Intelligence, Surveillance & Reconnaissance (C4ISR)
4. Enabling Technology
5. Innovative Systems

The TJCSG established a Technical Working Group in each of the five technical capability areas. The Technical Working Groups advise the TJCSG concerning the logical attributes for each function and sub function.

The five Technical Working Groups met individually, as well as collectively, at a TJCSG off-site workshop held in August 2003. The Technical Working Groups identified four attributes common to all three functions:

People
Facilities & Equipment
Natural Resources
Worload

The Technical Working Groups agreed to subdivide their technical capability areas into finer pieces which they call technology areas. Examples of technology areas are sensors, information technology, electronics, materials, air vehicles, ground vehicles, space vehicles, sea vehicles and more.

The Technical Working Groups have overlapping interest in many technology areas. The Technical Working Groups found there was no practical way to subdivide technology areas so as to make each technology area of interest to a single Technical Working Group.

The Technical Working Groups recommended that the TJCSG not confine its capacity analysis to a two-dimensional space of functions and attributes because consideration of technology areas enters into the process. Rather the Technical Working Groups recommended a three-dimensional analysis (see figure 2) of three functions (each with sub functions), four attributes, and a number of technology areas (a double digit number whose value it not yet firmly fixed).

The overlapping arrows corresponding to each of the Technical Working Groups in figure 2 are notional, intended to make clear that each technology area may be relevant to more than one Technical Working Group.

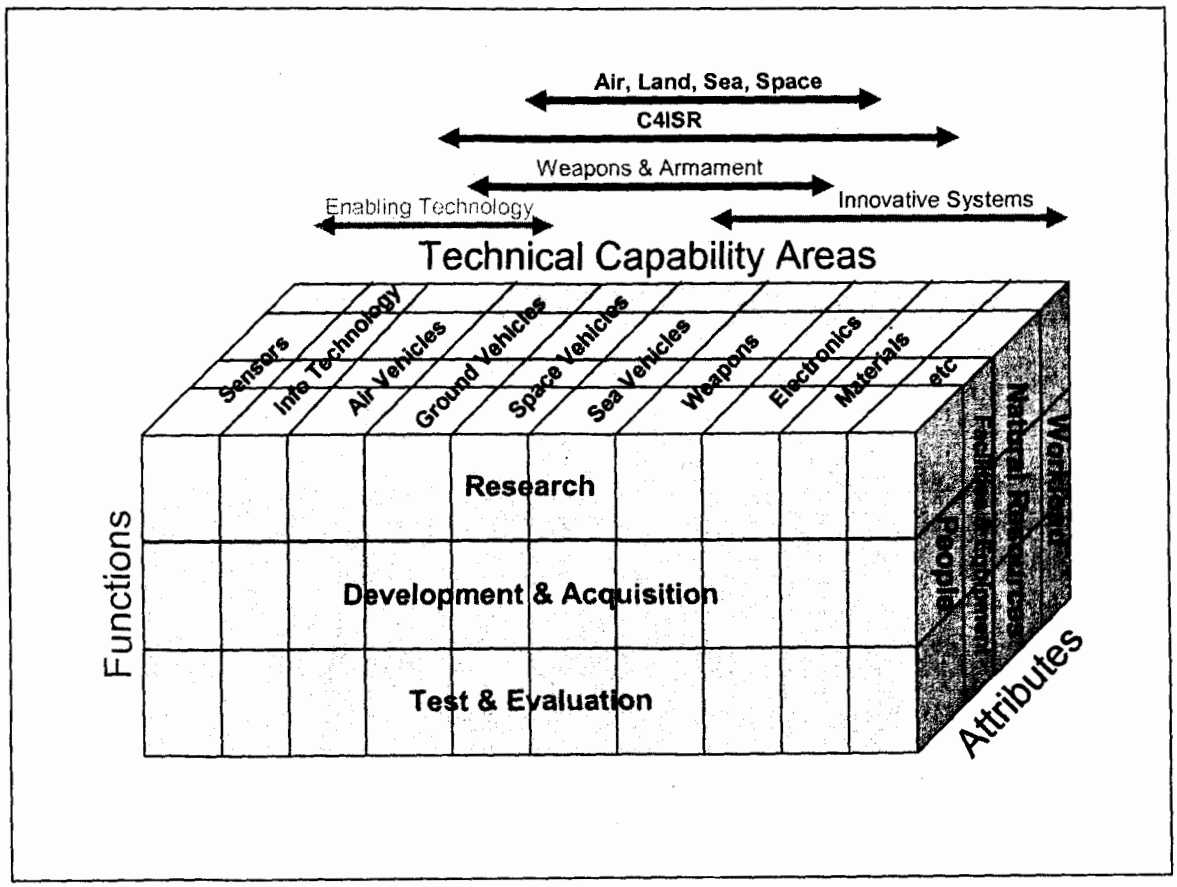


Figure 2: Technical Functions, Attributes, and Technical Capability Areas

The Working Groups have submitted capacity analysis questions to the TJCSG. These questions fall into two categories. The first category is questions which are common to all three functions for each attribute independent of the technical capability areas. The second category is questions which vary among the three functions for each attribute, and also vary for each technical capability area.

The capacity analysis questions will be chosen from those submitted to catalog the total technical infrastructure. The capacity analysis phase will catalog not only how the infrastructure is currently used, but also seek to ask questions which will enable us to determine if the capacity is flexible to accommodating alternate and additional uses in other technical functions or in other technical capability areas if alternate/additional equipment and alternate/additional technical staff were brought to an installation.

Attributes of the Functions

The five Technical Working Groups identified four common, measurable attributes ("technical infrastructure" or "factors of production") that characterize the development technical products for DoD. The common capacity attributes are:

1. **People** (human intellectual resources): In order to continue to develop superior capabilities, the technical functions must recruit and retain quality people. Whether it is the research function, the development & acquisition function, or the test & evaluation function, the foundation is people. The people include scientists and engineers, business managers, program managers, etc. These people have specialized skills over a wide range of disciplines. For example, the skills of a medical research scientist are quite different from those of an acquisition manager or a test range engineer.

   The September 30, 2001 Quadrennial Defense Review Report states that DoD needs a technical "support structure that is equally agile, flexible, and innovative." Organizing a technical infrastructure that will attract talented people because the infrastructure in which they will work is agile and flexible is a desirable outcome of BRAC. We refer to the talented people as intellectual capacity. The intellectual capacity of the workforce is measured by items such as educational credentials, technical credentials, and acquisition credentials. The total workforce is measured whether military, government, or non-government employees.

2. **Facilities and equipment**: Development of quality technical products requires infrastructure outfitted with appropriate facilities and equipment. The capacity analysis will measure facilities and equipment using appropriate units. Examples of units of measure are floor space; occupancy; inventory of specialized equipment including it size, weight and value; and available utilities. The capacity analysis will consider which spaces might be re-configured to perform additional functions or different functions for the needs of another of the five capability areas.

   The capacity analysis will measure the availability or expansion potential for research, development & acquisition, and test & evaluation across the five technical capability areas. The capacity analysis will measure the current use of the facilities and equipment, their maximum historically demonstrated use, and seek certifiable

estimates of their theoretical maximum capacity and the factors that must change in order to achieve maximum capacity.

3. **Natural Resources** (Notable geographic and climate features and environmental operating constraints: Geographical features are items such as mountains, forests, swamps, wetlands, oceans, rivers; access to air, land, sea & space ranges; relationship to population centers; proximity to centers of technical excellence external to DoD. Typical units of measure are miles, acres, and square miles. Climate features are items such as hot, cold, wet, and dry. Examples of units of measure are temperature, days with/without precipitation, days that operations are not curtailed. Examples of environmental operating constraints are lost opportunities to do technical work due to the presence of endangered plants and animals; a requirement for environmental operating permits (emissions permits or limitations on when or how the facility operates); noise constraints.

4. **Workload**: Workload represents the product of how we apply our people, facilities and equipment, subject to the constraints associated with the natural resources at our facilities. Examples of units of measure are by operating hours, funding, number of tests, number of test hours, the complexity or scope of the tests, number of acquisition programs by acquisition category, the amount of the program funding available to the facility, the number of transitions, milestones completed, and items fielded over the past ten years.

   Our technical capacity has evolved over a period of decades. Some of our technical infrastructure is over 50 years old today. It is possible that some facilities are operating at less than their full capacity or were not designed with agility and flexibility in mind. Historical data will be sought to estimate the maximum demonstrated capacity of the facility and to estimate the ability of the facility to do work in different functions or different technical capability areas. It is also possible that a facility has capacity which exceeds its maximum demonstrated capacity. Facilities will be asked if they can provide certifiable data as evidence that there is a theoretical capacity which exceeds the maximum demonstrated capacity.

   Since BRAC 2005 looks 20 years into the future, the infrastructure we retain must remain relevant in the future. The Department needs a flexible and agile technical infrastructure which can provide for a technical future we cannot predict. The TJCSG will ask questions which give the respondent the opportunity to make clear the flexibility of a facility to be used for different purposes than the facility has been used in the past. The TJCSG will consider during later phases of BRAC the potential of using existing technical resources in a different way.

Metrics Measuring the Capacity of Each Attribute

While the four attributes are common to all three functions, the metrics for each attribute may be different for each function as well as for capabilities within each sub function. The skills characterizing a talented research scientist (Nobel prize-like scientific insight) are different from the skills characterizing a talented test & evaluation engineer (precision in measuring and assessing tested system performance) are different from the skill characterizing an insightful acquisition program manager (smart buyer insight and business acumen).

The four attributes relevant to all five capability areas are listed below. We suggest additional examples of both metrics and units (*in italics)* that might be used for each attribute. We assume the capacity collection will be made at a specific time (e.g., close of FY03). Unless otherwise noted, the capacity questions shall address the instantaneous number (for personnel) and the previous fiscal year for financial and product data. Historical records will be requested to certify the maximum demonstrated capacity.

1. **People**
    a. Total Personnel—technical & non-technical (military & ranks, government & job series & grades, contractor, FFRDC, salary ranges) *(total number of people at date of data call; for interns use peak number previous summer, also provide same information for the past ten years)*
    b. Workforce education and accomplishments (*functional code, academic credentials, percent with high school diploma, associates degree, bachelor's, master's, Ph.D, professional certificates, at time of data call and for the past ten years; number of staff with multiple interdisciplinary degrees & multiple interdisciplinary professional certificate and what those degrees & certificates are for each one))*
        i. patents, patent applications, patent citations, refereed papers, etc) *(total number of each relevant accomplishment and number per 100 technical workers)*
        ii. professionally certified acquisition corps members (*number by level)*
        iii. professionally certified test & evaluation acquisition corps members (*number by level)*
        iv. Training resources available to the workforce *(number of working relationships with academic institutions, number of academic institutions within 25, 50 & 100 miles, number of employees enrolled in academic institutions (with level of training being received, e.g. high school, junior college, undergraduate, professional certification, masters, doctorate), training & education budget)*
    c. Workforce experience (*Average number of years for technical entire staff sorted by discipline and education)*

2. **Facilities & Equipment**
   a. Technical space (size *(square feet, square miles)*, usage *(percent occupancy; hours operating per year)*, recapitalization schedule (*average age of building and equipment; number of years until equipment and buildings scheduled to be updated)*
   b. Office and administrative (size *(square feet)*, usage *(percent occupancy, hours operating per year)*
   c. Upgrade / replacement costs *(dollars total)*
   d. Special or unique features and equipment *(list, size, weight, value; number & data collection capacity)*
   e. Internet & information technology infrastructure *(type of connectivity; % connected to special equipment data acquisition systems)*
   f. Expansion potential *(available acres for entire government owned property at the facility, number & size of vacant buildings)*
   g. Utilities, public & private (*kilowatt hours, cubic feet per hour, gallons per day, other traditional utility service measures)*

3. **Natural resources**
   a. Notable geography (mountains, forests, swamps, oceans, rivers, wetlands, etc.) *(square miles, acres, etc.)*
      i. Distance to mission-related organizations (military, industry, academic) *(distance to top 3-5 "customers" in each category)*
      ii. Unencumbered space (*within 25, 50 & 100 mile radius, & further*)
      iii. Population densities (*within 25, 50 & 100 mile radius, & further*)
   b. Notable climate (hot, cold, wet, dry, etc.)*(number of days per year above or below a notable temperature; number of days per year with/without precipitation; number of days that operations are not curtailed by weather, etc.)*
   c. Notable environmental features *(list and state notable feature)*
      i. Endangered species *(list & number of each)*
      ii. Environmental constraints (*list & quantity of things subject to regulation & mitigation procedures)*
      iii. Operational constraints (*list, e.g., limited use regulations, etc.)*
      iv. Licenses & operating permits (environmental, safety,...) *(number, type)*

4. **Workload**
   a. Funding, total and by budget activity/color of money *(actual funding & actual work years)*
   b. Funding from external (reimbursable) customers *(number of customers, number of dollars from each)*
   c. Funding distribution by Acquisition category (ACAT) *(percent of total funds allocated to ACAT I, II, III, and IV programs)*

d. Tests (*number of tests, test hours, time per test, cost per test)*
e. Acquisition Programs (*total number of validated active acquisition programs)*
f. Transitions & milestones & fielded items (*total number of demonstrations moving from the laboratory to a more mature customer in the past ten years)*
g. International and Interagency Agreements (*total number of agreements, average project duration, number of products transitioned by either partner under any agreement)*

Process to measure capacity of each attribute

Each Technical Working Group has designed questions for all functions and attributes relevant to capabilities within their technology area. Based on this capacity analysis plan the Technical Working Groups will integrate their lists of questions among the functions and among the attributes. The TJCSG will approve the questions and provide them to the ISG as an appendix to this report.

Process to measure surge capacity of each attribute

The TJCSG envisions at least two elements of technical surge. One element is surge capacity which enables us to do more of what we currently do (or have done in the past) and to do it with more technical agility than we have done in the past. We have ideas on how to measure this surge capacity.

The TJCSG feels the more elusive element of surge capacity is how we determine our surge capacity to do something we have not done before. It may be that we make a discovery in our research function which presents us with a new technology whose war fighting benefit is revolutionary. It may be the warfighter provides a new operational need which can be met by applying known technology in a new way. It is difficult to measure technical surge capacity for an unknown technical capability that will emerge at an unknown moment in the future.

Historically, in the technical functions, one way of providing surge has been through reallocation of people, facilities and equipment, natural resources, and workload. That was the procedure we used to provide thermobaric weapons in 2001.

The TJCSG assumes that the Department's technical capacity can be sorted into three independent sets. There is the set of technical capacity which the Department has, needs, and regularly uses. There is the technical capacity the Department has but does not use or need (excess capacity). There is the set of technical capacity the Department has, needs, but seldom uses (necessary unused capacity).

The last set of technical capacity (has, needs, seldom uses) is that which is available for technical surge. Our methodology for determining surge requirements is based on information we will gather during capacity analysis being used in conjunction with information we will gather during the military value phase.

During the capacity analysis phase we expect to learn what portion of the technical capacity is necessary to meet the current technical workload. We also expect to learn the maximum demonstrated technical workload which may be accomplished using the facilities and equipment currently owned by the Department. The difference between the two (maximum demonstrated workload minus current workload) is one measure of surge capacity.

We will also give respondents an opportunity to estimate the maximum theoretical workload of their technical facilities (if the estimate is based on certifiable data). The difference between the two (maximum theoretical workload minus current workload) is another measure of surge. In this case, it is the theoretical surge capacity of each facility for which there is certifiable maximum theoretical workload data.

While this gives us estimates of surge capacity, it does not tell us if the surge capacity is exactly matched to the Department's needs, too little surge capacity, or too much surge capacity (meaning some of the capacity falls into the set of excess capacity).

In the military value data call, we will ask questions to determine where surge capacity is too little or too much. Where technical facilities have a specified war-time or contingency role established in approved war plans, that surge capacity needs to be maintained at that facility or at a facility to which it might be realigned.

Referring to Figure 2, we will survey how capacity is being applied to the capability areas defined by the Technical Working Groups. As the data is analyzed, information will emerge that determines which capabilities are military unique or of special importance to the military relative to industry, academia, and others. Presumably, the Department needs to provide almost the totality of surge capacity in those areas unique or special to the military.

In areas where there is academic interest, industrial/commercial interest, interest of non-Defense agencies or foreign Governments, the Department can look to others to provide for some of our technical surge capacity. To the extent that the Department is assured that the external parties will maintain the capacity and make it available to the Department in times of surge, our technical capacity can depend on others to provide much of our technical surge requirements. In the absence of assurance from others, the Department needs to provide for its own technical surge requirements.

As an example, we may find that there are technical capability areas of interest to the commercial sector where the Department needs to provide little surge capacity.

Conversely, there may be some military unique capabilities which are so unique that the Department must maintain a capability despite the fact the infrastructure (facility, laboratory, test range, etc.) has little or no current usage.

The conjunction of the surge capability captured during the capacity data call with the surge requirements emerging through analysis of the military value data will enable us to establish surge requirements across the technical capabilities for each attribute and each function.

Battle Plan

We offer two views of our battle plan. A simple depiction in figure 3, and a more detailed view in figure 4.

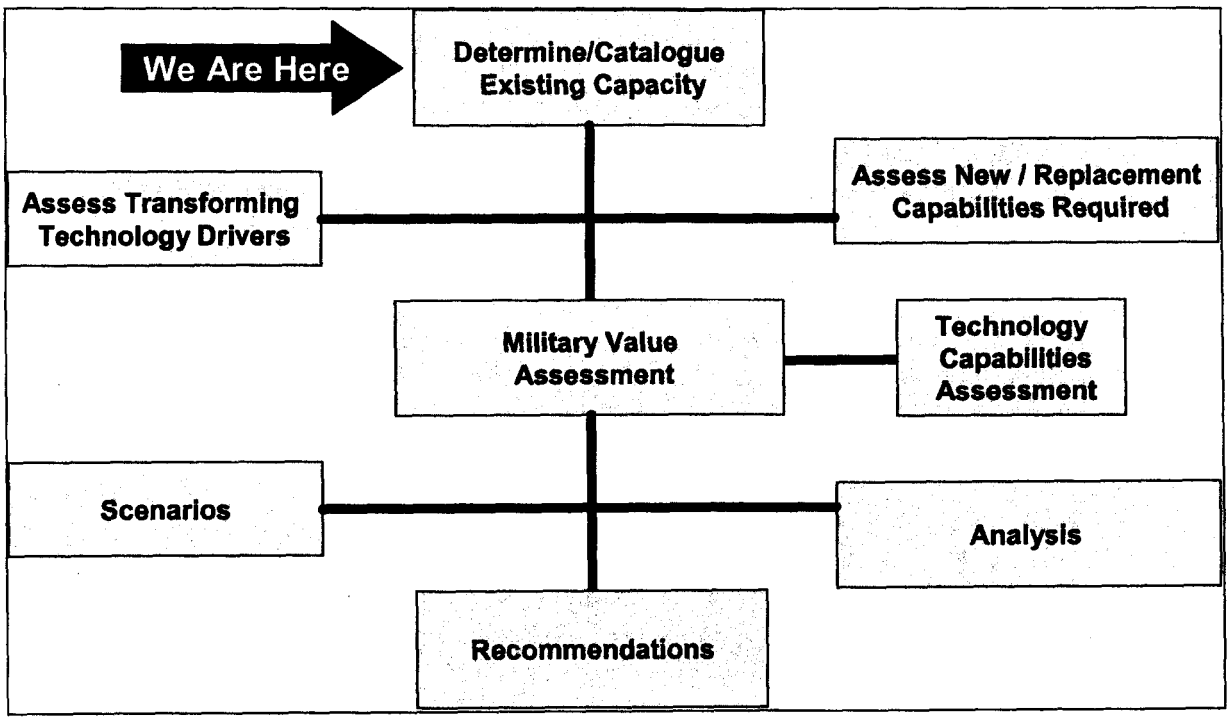


Figure 3: Simplified Battle Plan

The detailed Battle Plan shows all of the major steps and the interfaces that the TJCSG will employ in order to generate its recommendations for BRAC 2005.

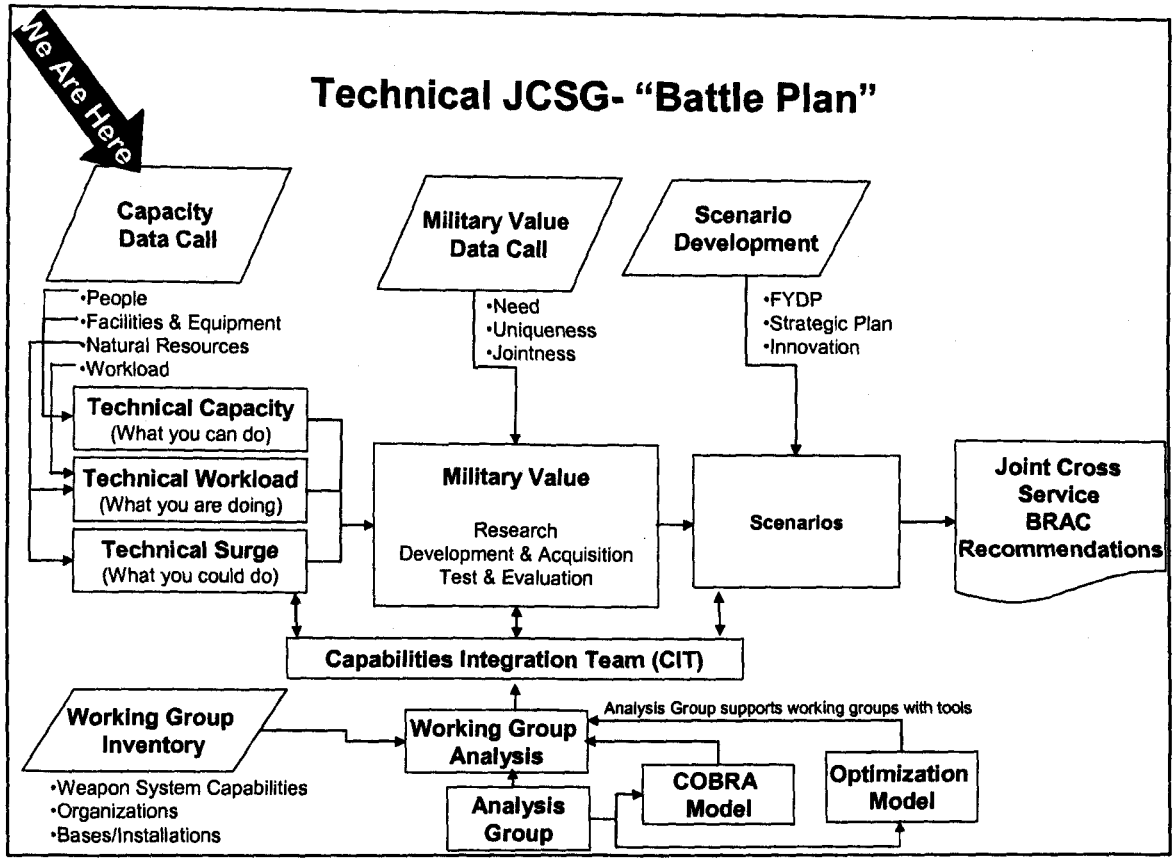


Figure 4: TJCSG Detailed Battle Plan

Section 3: Issues Impacting Analysis

We have overlaps with three other JCSG groups (Medical, Education & Training, Headquarters & Support Activities (includes interaction with DISA)) which must be monitored to assure that issues or conflicts do not arise. At this time we have no issues or conflicts relating to Ranges (E&T JCSG) or Communications and Information Technology (H&SA JCSG). The TJCSG is coordinating its capacity analysis with each.

We are aware of a concern in the Medical JCSG. The medical & dental aspects of human research are being addressed by our Enabling Technology Working Group (ETWG). That Working Group includes two members of the Medical JCSG. A prominent role has been assigned to the Medical JCSG representatives on the TJCSG Working Group dealing with the human research functions.

The TJCSG finds no evidence of how DoD has explicitly planned for technical surge in the past. Rather, we believe it has been done in the manner we discuss in Section 2. We welcome insights from the ISG and Military Services that might lead to a more quantitative methodology for measuring our surge capacity than we offer in this report.

The technical function is highly dependent upon the intellectual capacity of its people. We can count our people, facilities and equipment, catalog the natural resources which are attributes of our function, and measure our workload. We are working on questions to capture and quantify the intellectual capacity of our people.