THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-3010

ACQUISITION,
TECHNOLOGY
AND LOGISTICS

ACTION MEMO

October 20, 2004, 4:30P.M.

FOR: SECRETARY OF DEFENSE

FROM: Michael W. Wynne, Acting Under Secretary of Defense, (Acquisition, Technology and Logistics)

SUBJECT: Progress in Interoperability

- You gave me the assignment to drive Interoperability in October of 2001.
- The Deputy Secretary set a goal of achieving interoperability by 2008.
- I have partnered with ADM Ed Giambastiani to develop a Roadmap to achieve the 2008 goal, and we and our staff have held numerous seminars and meetings with all the stakeholders to include our industry partners.
- I am proud to report to you that we have jointly published the Roadmap and it is enclosed (TAB B).
- The short informational presentation illustrates the why and what we have thus far accomplished (TAB C).
- A cultural change of this magnitude continues to require perseverance and JFCOM, with our support, is accomplishing that part. Clearly an endorsement of this Roadmap as directive in nature would greatly assist that effort. I have prepared a draft note of endorsement (TAB **A),** if you agree.

RECOMMENDATION: Secretary of Defense sign memorandum (TAB A).

COORDINATION: JFCOM (TAB D)

Attachment(s):
As stated

Prepared By: Ms. Robin Quinlan, 703-697-8048

JOINT BATTLE MANAGEMENT COMMAND AND CONTROL (JBMC2) ROADMAP

Version 1.0
May 2004

FOR OFFICIAL USE ONLY

Executive Summary

Central to the transformation of U.S. forces, and their ability to operate in a coalition environment, are effective Joint Battle Management Command and Control (JBMC2) capabilities. The goal of this roadmap[1] is to develop a coherent and executable plan that will lead to integrated JBMC2 capabilities and interoperable JBMC2 systems that in turn will provide networked joint forces:

- *Real-time shared situational awareness at the tactical level, and where appropriate, at the operational level*
- *Fused, precise, and actionable intelligence*
- *Decision superiority enabling more agile, more lethal, and survivable joint operations*
- *Responsive and precise targeting information for integrated real-time offensive and defensive fires*
- *The ability to conduct coherent distributed and dispersed operations, including forced entry into anti-access or area-denial environments.*

This roadmap will be the vehicle for prioritizing, aligning, and synchronizing Service JBMC2 architectural and acquisition efforts. Where policy and other acquisition initiatives are defined to drive JBMC2 developments and related activities, the specific means of application to JBMC2 will be via updates to this roadmap and decisions made by the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)) and U.S. Joint Forces Command (USJFCOM) to ensure overall harmonization across affected efforts and programs. This roadmap provides a strategy with three major parts for integrating current and planned JBMC2 capabilities. These are described below.

JBMC2 Capabilities Development and Implementation. The first part of the strategy will focus on the development, implementation, and testing of the elements needed to provide enhanced JBMC2 capabilities for the warfighter. Figure S.1 shows major milestones for the components of this part of the strategy.

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[1] *Joint Battle Management Command and Control (BMC2) Roadmap,* **Memorandum from the Under Secretary of Defense for Acquisition, Technology, and Logistics, June 9, 2003 (see Appendix C).**

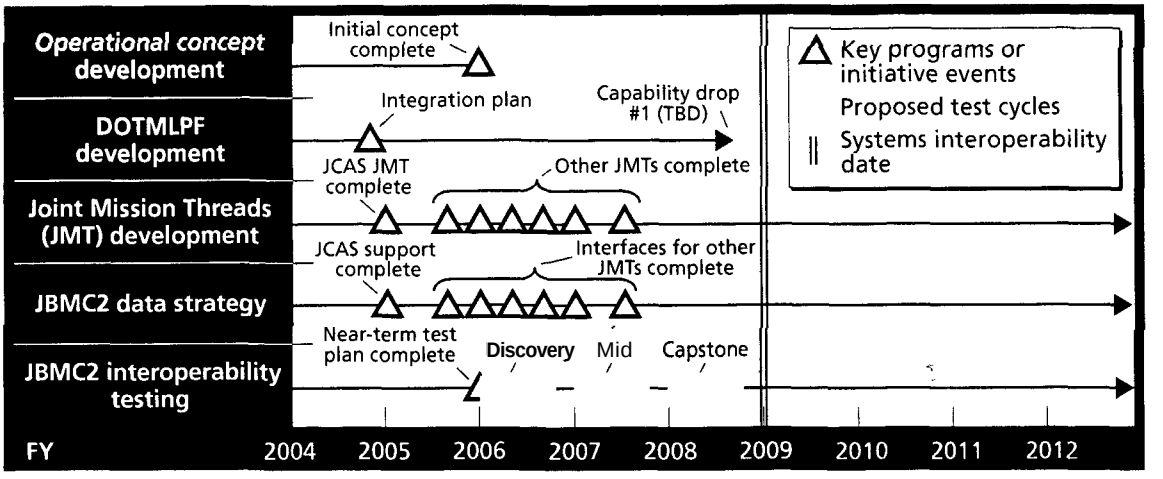

Figure S.1—JBMC2 Capabilities Development and Implementation

A comprehensive plan to develop an overarching JBMC2 operations concept that will guide integration of Service JBMC2-related Concepts of Operations will be completed by the end of FY 2004. This operations concept is being developed by USJFCOM and the US Strategic Command (STRATCOM) in coordination with the Services and agencies. The operational concept will be completed by the start of FY 2006.

In collaboration with the Combatant Commands (COCOMs), Services, agencies, and the Joint Staff, USJFCOM will lead the development of JBMC2 Joint Mission Threads (JMTs), which are comprehensive descriptions of architectural elements (including associated operational requirements and the system of systems engineering approach), of how the joint force will execute seven key warfighting capabilities using major JBMC2 capabilities. The seven JBMC2 JMTs are:

- Joint Close Air Support (JCAS)
- Joint Ground Maneuver
- Time-Sensitive Targeting
- Joint Task Force Command and Control
- Integrated Air/Missile Defense
- Integrated Fires
- Focused Logistics.

A comprehensive approach for integrating the JMTs will be developed that will ensure that the situational awareness and collaboration capabilities defined in the JMTs are common across JMTs and therefore will be common across the joint force.

Figure S.1 identifies when the analyses for each JMT will be completed (the first JCAS JMT analysis will be completed by the end of FY *2004).* All JMT analyses will be completed by FY 2007 to allow approximately two years for JBMC2 integration and

interoperability testing prior to the end of FY 2008, the deadline the Deputy Secretary of Defense has established for the integration or phase-out of legacy JBMC2 systems.[2] Evolutionary development of the JMTs will continue to respond to lessons learned from capabilities testing. JMT development past the Deputy Secretary of Defense's interoperability deadline will capitalize on the Global Information Grid (GIG) net-centric infrastructure improvements that will be available in FY 2009 and beyond.

In conjunction with JMT development, the JBMC2 Data Strategy defines how JBMC2 systems will interact with the network infrastructure (both current and future net-centric infrastructure) to share information. Key to this data strategy are *JBMC2 common interfaces,* which are comprehensive descriptions for how a set of information will be shared in common across JBMC2 systems, ranging from high-level models and rules for representing information to technical specifications for using the network infrastructure. The interfaces supporting the JCAS JMT will be completed by the end of FY 2004, in parallel with JCAS JMT development; the interfaces supporting other JMTs (different from those developed for JCAS) will be developed by the end of FY 2006. Evolution of the interfaces will continue after FY 2006 to respond to lessons learned from capabilities testing. **As** with the JMTs, USJFCOM will lead development of the common interfaces.

Even the best-designed architectures, software, and systems may be flawed in subtle ways and subject to unforeseen interoperability problems. Therefore, the JBMC2 integration strategy incorporates a series of joint interoperability tests that demonstrate how well planned improvements in JBMC2 capabilities are being implemented. Test plans will be developed for ensuring that JBMC2 systems are interoperable by or shortly after the start of FY 2009. Figure S.1 shows the major testing milestones and proposed test cycles between now and FY 2009. Each cycle will comprise a number of test events, to be determined in accordance with systems engineering needs. The first cycle, to be held in FY 2006, is intended to discover JBMC2 interoperability problems. The second cycle, in FY 2007, is intended to evaluate progress in providing the capabilities. The final cycle, in FY 2008, is the only traditional capstone "test" series, intended to certify whether systems are providing the needed capabilities.

Interoperability test events within each cycle will examine the ability of each JBMC2 program cluster to jointly provide an end-to-end JBMC2 capability. The program clusters will parallel the seven JMTs described above. The cornerstone of the program clusters will be a set of JBMC2 Pathfinder Programs described later in this roadmap, which correspond to those major programs providing critical JBMC2 functionality across the JMTs. Each JBMC2 program cluster will undergo testing in each of the three cycles scheduled prior to FY 2009, as described above.

Where possible, these joint interoperability tests will employ hardware-in-the-loop and software models of JBMC2 systems using Joint Distributed Engineering Plant (JDEP)-

[2] *Command and Control (C2) Legacy Interoperability Strategy and Milestone Action Plan,* Memorandum from the Deputy Secretary of Defense, October 12, 2001.

like capabilities so that interoperability problems can be caught early and corrected before more expensive full-scale operational testing is done. In order to meet the ambitious test schedule presented in this roadmap, the JDEP-like capabilities of the DoD test community have to be expanded significantly. A plan for doing this is laid out in this roadmap.

Plans to Make Interoperable or Converge JBMC2 Programs. The second part of the JBMC2 integration strategy provides plans to make interoperable or converge JBMC2 programs, as shown in Figure S.2.

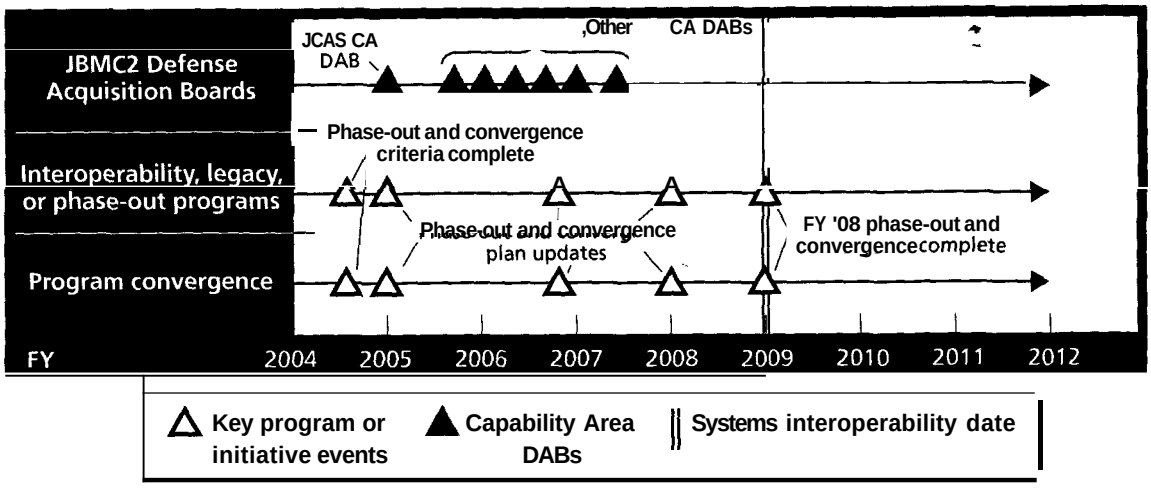

Figure S.2—Plans to Make Interoperable or Converge JBMC2 Programs

The integration strategy for JBMC2 JMT capabilities will be defined by CDR USJFCOM via the JBMC2 Board of Directors (BoD) and provided to USD(AT&L). USD(AT&L) will be the Milestone Decision Authority for JBMC2 program clusters, and will convene Capability Area Defense Acquisition Boards (DABs), with CDRUSJFCOM as an invited member, as required to assess progress in developing integrated JBMC2 capabilities for JBMC2 program clusters. The first JBMC2 Capability Area DAB, for the JCAS JMT program cluster, will be conducted at the end of FY 2004, in conjunction with the completion of the JCAS JMT and supporting common interfaces. JBMC2 Capability Area DABs for the remaining JMT program clusters will be held by the end of FY 2006.

The second row of Figure S.2 shows how JBMC2 system interoperability and legacy phase-out criteria will be developed and applied to designate systems as interoperable, as capable of being made interoperable (and hence to be maintained as programs of record), or as legacy systems (to be phased out). Objective and transparent criteria, and the associated assessment methodology for identifying interoperable and legacy systems are presented in this first-order roadmap. Comprehensive system interoperability and legacy phase-out processes (that factor in potential value of JBMC2 initiatives) will be in place by the end of FY *2004.* Legacy systems will be identified with the objective of making the majority of them interoperable or completing their phase-out by the end of FY 2008. JBMC2 program

convergence and phase-out plans will be updated as required to support JBMC2 Capability Area DABs. The third row of Figure S.2 shows that a program convergence process will be in place by the end of FY 2004, with the objective of converging selected programs into a smaller set of interoperable programs by the end of FY 2008.

JBMC2 Initiatives. The third part of the strategy addresses the battlespace picture initiatives and net-centric underpinnings, which are key to providing integrated JBMC2 capabilities. The key milestones for these initiatives are shown in Figure S.3.

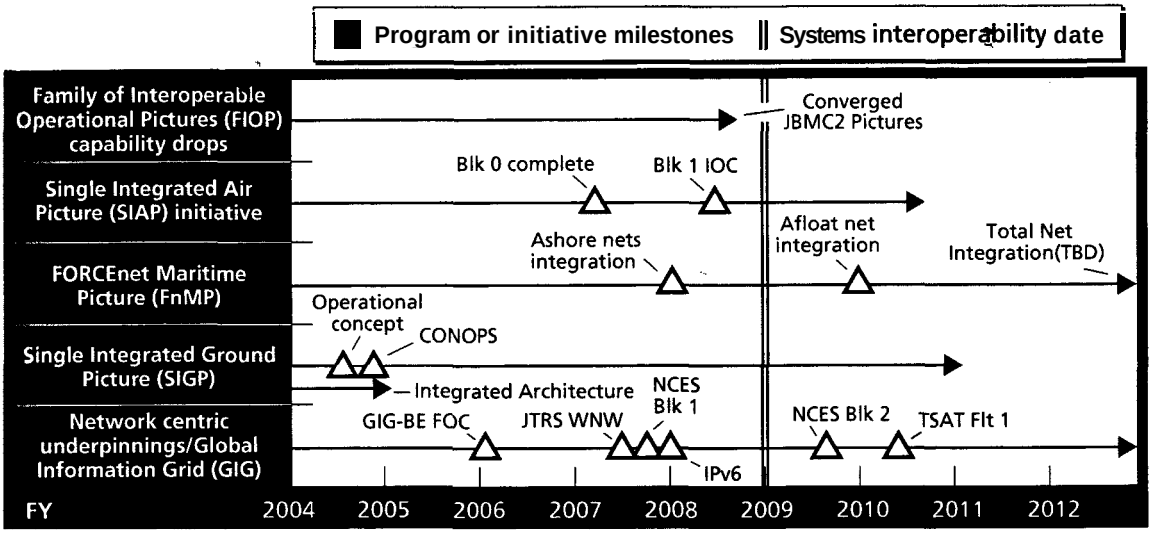

Figure S.3 — JBMC2 Initiatives

In accordance with Management Initiative Decision (MID) 912,[3] the joint battlespace picture initiatives have been placed or will fall under the oversight and directive authority of USJFCOM. These key elements include USJFCOM's Family of Interoperable Operational Pictures (FIOP) and the Single Integrated Air Picture (SIAP) initiatives, the Navy's FORCEnet Maritime Picture (FnMP) initiative, and the Army-led, multi-Service Single Integrated Ground Picture (SIGP) initiative.

FIOP is developing a range of applications and services for insertion into programs of record, which can be used to integrate JBMC2 systems. These FIOP capability drops are not shown explicitly in Figure S.3 but are discussed in detail in this roadmap. These will facilitate the ability to generate battlespace pictures relevant to the joint warfighter by FY 2008.

SIAP is developing executable software, algorithms, and data models for use by or insertion into programs of record. Block 0 of SIAP is developing systems engineering products for program design and integration and should be complete in FY 2007. The first SIAP deliveries of executable software to programs of record will be in Block 1. SIAP Block 1

[3] *Joint Battle Management Command* **and** *Control,* **Management Initiative Decision 912, January 7,** *2003.*

IOC is scheduled to occur in FY 2008. It will be fielded to a number of programs shortly thereafter.

Several major milestones for the Navy's FnMP are shown in Figure S.3. These milestones ensure that FORCEnet ashore communications networks can be integrated into the GIG and that afloat communications networks can rapidly assimilate SIAP and FIOP capability drops. The integration of Joint Command and Control (JC2) into the FORCEnet afloat JBMC2 architecture is recommended to occur by FY 2009.

SIGP was initiated in FY 2004 and will fall under USJFCOM MID 912 oversight in the future. SIGP will develop Doctrine, Organization, Training, Materiel, Leadership, Personnel, and Facilities (DOTMLPF) operational products under the leadership of USJFCOM; in FY 2004 and FY 2005, these include the SIGP Operational Concept, Concept of Operations, and Integrated Operational Architecture. These will initially be developed to define the operational context and scope for SIGP. Interoperability gaps will be identified, and interoperability enhancements spirally developed and tested to provide increased capability to the warfighter.

Net-centric communications and services will underpin the evolving JBMC2 capabilities and applications for the joint warfighter. Key GIG development milestones are shown in the last row of Figure S.3. The GIG-Bandwidth Expansion (GIG-BE) program will reach full operational capability (FOC) in FY 2005. The first block of Network-Centric Enterprise Services (NCES) will be spirally developed over a two-year period and become available in FY 2007. NCES Block Two will be spirally developed in this period as well and reach IOC in FY 2009. A major upgrade of the GIG will occur in FY 2008 when it makes the transition to Internet Protocol Version 6 (IPv6). Another key component of the GIG, the Joint Tactical Radio System (JTRS) Wideband Networking Waveform (WNW) will reach IOC in FY 2008. JTRS WNW will provide high-capacity communications links and dynamic Internet protocol routing capabilities to tactical users. The first Transformational Communications Satellite (TSAT) will be launched in FY 2010 and provide an initial element of a high-capacity laser communications backbone in space. This set of GIG programs will provide the network-centric underpinnings for all JBMC2 programs and initiatives.

JBMC2 Capability Development and Integration Management

USD(AT&L) leads the development of the JBMC2 Roadmap, in partnership with USJFCOM, and with the participation of the Joint Staff, Joint Requirements Oversight Council (JROC) (or Functional Capabilities Boards (FCBs) on behalf of the JROC), Program Analysis & Evaluation, Services, and Agencies. In accordance with DoD 5000.2, Operation of the Defense Acquisition System, the DoD will use this roadmap to conduct capability assessments, guide systems development, and define the associated investment plans as the basis for aligning resources and as an input to Strategic Planning Guidance, Program Objective Memorandum development, and program and budget reviews.

USD(AT&L) also will review and approve the integration strategy for each JMT program cluster, and will be the milestone decision authority for JBMC2 program clusters. USD (AT&L) will convene Capability Area DABs as required to assess progress in developing integrated JBMC2 capabilities for specific JMTs and associated program clusters. JBMC2 Capability Area DABs will be chaired by USD(AT&L) with CDRUSJFCOM as an invited member.

USJFCOM will lead development of JBMC2 capabilities. The JBMC2 Board of Directors, chaired by the USJFCOM Deputy Commander, will be the principal forum for leading JBMC2 capabilities development and reviewing subsequent requirements.

The Joint Staff (or Principal Staff Assistant (PSA) for business areas) and the JROC (FCBs on behalf of the JROC) will review and approve programmatic requirements associated with JBMC2 and will participate in the JMT development efforts described above, in accordance with the Joint Capabilities Integration and Development System (JCIDS) process (CJCSI 3170.01D).

Additional Future Steps

USD(AT&L) and USJFCOM are jointly developing, for inclusion into the next update of the JBMC2 Roadmap, a systems engineering approach linking the operational and tactical capabilities defined in the JMTs with the procurement and development expertise of the Services and agencies to ensure integrated JBMC2 capabilities result from the development and testing process defined herein.

Joint interoperability testing milestones have been added to the already established JBMC2 or GIG program plans presented in this roadmap. Future versions of the JBMC2 roadmap will contain the results of critical path program analysis and may recommend program schedule changes, the integration of MID 912 initiative capabilities, and other system design changes to improve JBMC2 interoperability, better align planned programs, and ensure that integrated JBMC2 capabilities are delivered in a series of coherent well-planned "capability drops.'' Options for recommended program changes will involve time, capability, and resource trade-offs. Supporting analyses for such trade-off decisions will be conducted to assess how much JBMC2 integration is needed to support the conduct of specific military missions. An important element to consider in these analyses is how quickly new JBMC2 capabilities will actually flow to Combatant Commanders and warfighting units. These issues will be addressed in future iterations of the roadmap.

Implementation of the JBMC2 integration strategy described above will help ensure that joint forces possess interoperable and well-integrated JBMC2 capabilities in future conflicts. If Service JBMC2 programs and DOTMLPF initiatives are not aligned and synchronized effectively and if these systems are not tested thoroughly in a realistic joint environment, then Service programs and doctrine will continue to evolve independently for the most part, and new and unpredictable interoperability problems and doctrinal conflicts will likely emerge, to the detriment of U.S. joint forces in future conflicts.

THE SECRETARY OF DEFENSE
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WASHINGTON, DC 20301-1000

NOV 1 2004

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
COMMANDERS OF COMBATANT COMMANDS
ASSISTANT SECRETARIES OF DEFENSE
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
ASSISTANTS TO THE SECRETARY OF DEFENSE
DIRECTOR, ADMINISTRATION & MANAGEMENT
DIRECTOR, PROGRAM ANALYSIS AND EVALUATION
DIRECTOR, FORCE TRANSFORMATION
DIRECTORS OF THE DEFENSE AGENCIES

SUBJECT: Joint Battle Management Command and Control (JBMC2) Roadmap Implementation

Joint interoperability is key to the transformation of our nation's defense. Several years ago I set forth a mandate with the Deputy Secretary to achieve the goal of interoperability by 2008.

In line with that goal, the US Joint Forces Command and USD(AT&L) partnered to lead the development of a JBMC2 Roadmap. I commend US Joint Forces Command, USD(AT&L) and the entirety of the collective effort that went in to producing the JBMC2 Roadmap.

I fully support and endorse their joint implementing letter in full measure, understanding that this Roadmap is directive in the mission sense of interoperability and integration, and is a living document. I continue to believe that interoperability to the tactical level is vital to our warfighting capability.

US Joint Forces Command is my lead agency to implement this roadmap, with OUSD(AT&L) and the services in support.

OSD 17299-04