



DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

Office Of The Under Secretary

OCT 14 2008

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Guidance Memorandum: Prototyping and Competition

This Guidance Memorandum implements the requirement for prototyping and competition during the Technology Demonstration acquisition phase. It is effective immediately and valid for 180 days or upon publication of an Interim Change or rewrite of a publication superseding this memorandum, whichever is earlier. Compliance with this memorandum is mandatory. To the extent its directions are inconsistent with other Air Force publications, the information herein prevail, in accordance with AFI 33-360, *Publications and Forms Management*.

On 19 Sep 07, USD(AT&L) directed all pending and future programs to develop acquisition strategies that include two or more competitive prototypes of key systems or subsystems through the Milestone (MS)/Key Decision Point (KDP) B (see attached memo). This memorandum directs Air Force compliance and provides guidance for implementing that policy. This Air Force policy is effective immediately and applies to all pre-MS/KDP B programs, regardless of ACAT.

For Air Force implementation of this policy, prototyping means the process of assembling representative hardware and software into a configuration that can demonstrate and validate both operation and functionality of key elements of the proposed product or system. All acquisition efforts will perform a risk assessment on the system under development and develop a prototype plan based on the results of that assessment. At a minimum, prototypes should be considered for Critical Technology Elements (as defined in the DoD Technology Readiness Assessment Deskbook), manufacturing and integration risks, affordability, and to demonstrate the ability of the planned system to meet user requirements. Prototypes may be done at the system, sub-system, or component level as required to adequately address identified risks.

Competition and prototyping shall be considered an integral part of a program's acquisition strategy. Plans for competition and prototyping shall be documented in the Technology Development Strategy (TDS) (for programs under DoDI 5000.2) or the draft Acquisition Strategy (for programs under NSS 03-01) and shall be approved by the Milestone Decision Authority (MDA) at MS/KDP A for entry into the Technology Development or Concept Development (NSS 03-01) phase. The prototyping plan is also a fundamental part of a program's risk mitigation approach and shall be documented in the Systems Engineering Plan (SEP).

The MDA may elect not to conduct a multiple prototype and competition strategy if the risk assessment provides sufficient justification. However, unless specifically waived by the MDA, the exit criteria for the Technology Development phase (Preliminary Design phase for programs under NSS 03-01) and the entrance criteria for Preliminary Design Review (PDR) shall include successful demonstration of competitive prototypes in a relevant environment.

These prototyping and competition efforts should reduce risk, improve systems engineering planning and execution, and better quantify cost estimates for MS B/KDP C. The contents of this memo will be incorporated into AFI 63-101, *Acquisition and Sustainment Life Cycle Management*, and AFI 63-1201, *Life Cycle Systems Engineering*. My point of contact for this memo is Lt Col Carol Beverly, SAF/AQRE, carol.beverly@pentagon.af.mil, 703-696-0229.



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GARY PAYTON
Deputy Undersecretary of the Air Force
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Attachment:
USD (AT&L) memorandum of September 19, 2007

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ACQUISITION,
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THE UNDER SECRETARY OF DEFENSE

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19 SEP 2007

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
COMMANDER, U.S. SPECIAL OPERATIONS COMMAND
DIRECTORS OF THE DEFENSE AGENCIES

SUBJECT: Prototyping and Competition

Many troubled programs share common traits – the programs were initiated with inadequate technology maturity and an elementary understanding of the critical program development path. Specifically, program decisions were based largely on paper proposals that provided inadequate knowledge of technical risk and a weak foundation for estimating development and procurement cost. The Department must rectify these situations.

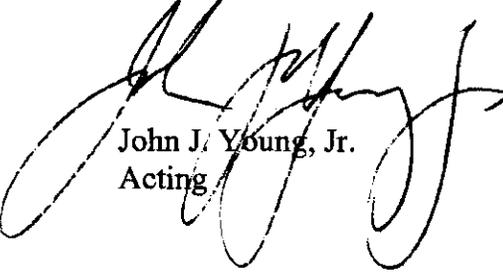
Lessons of the past, and the recommendations of multiple reviews, including the Packard Commission report, emphasize the need for, and benefits of, quality prototyping. The Department needs to discover issues before the costly System Design and Development (SDD) phase. During SDD, large teams should be producing detailed manufacturing designs – not solving myriad technical issues. Government and industry teams must work together to demonstrate the key knowledge elements that can inform future development and budget decisions.

To implement this approach, the Military Services and Defense Agencies will formulate all pending and future programs with acquisition strategies and funding that provide for two or more competing teams producing prototypes through Milestone (MS) B. Competing teams producing prototypes of key system elements will reduce technical risk, validate designs, validate cost estimates, evaluate manufacturing processes, and refine requirements. In total, this approach will also reduce time to fielding.

Beyond these key merits, program strategies defined with multiple, competing prototypes provide a number of secondary benefits. First, these efforts exercise and develop government and industry management teams. Second, the prototyping efforts provide an opportunity to develop and enhance system engineering skills. Third, the programs provide a method to exercise and retain certain critical core engineering skills in the government and our industrial base. Fourth, prototype efforts can attract a new generation of young scientists and engineers to apply their technical talents to the needs of our Nation's Warfighters. Finally, these prototype efforts can inspire the imagination and creativity of a new generation of young students, encouraging them to pursue technical educations and careers.



Based on these considerations, all acquisition strategies requiring USD(AT&L) approval must be formulated to include competitive, technically mature prototyping through MS B. The Component Acquisitions Executives will review all existing programs and all programs in the initial stages of development for the potential to adopt this acquisition strategy. It is the policy of the Department of Defense that this acquisition strategy should be extended to all appropriate programs below ACAT I.



John J. Young, Jr.
Acting

cc:
Under Secretaries Of Defense
Component Acquisition Executives