



March 7, 2013

Congressional Committees

Subject: *Department of Defense's Waiver of Competitive Prototyping Requirement for Combat Rescue Helicopter Program*

The Weapon Systems Acquisition Reform Act of 2009, as amended (WSARA), requires the Secretary of Defense to modify guidance to ensure that the acquisition strategy for each major defense acquisition program provides for competitive prototypes before Milestone B approval—which authorizes entry into system development—unless the Milestone Decision Authority waives the requirement.<sup>1</sup> Competitive prototyping, which involves commercial, government, or academic sources producing early prototypes of weapon systems or critical subsystems, can help Department of Defense (DOD) programs reduce technical risk, refine requirements, validate designs and cost estimates, and evaluate manufacturing processes prior to making major commitments of resources. It can also help reduce the time it takes to field a system, and as a result, reduce its acquisition cost. WSARA states that the Milestone Decision Authority may waive the competitive prototyping requirement only on the basis that (1) the cost of producing competitive prototypes exceeds the expected life-cycle benefits (in constant dollars) of producing such prototypes, including the benefits of improved performance and increased technological and design maturity that may be achieved through competitive prototyping; or (2) but for such a waiver, DOD would be unable to meet critical national security objectives.

WSARA also provides that whenever a Milestone Decision Authority authorizes a waiver of the competitive prototyping requirement on the basis of what WSARA describes as “excessive cost,” the Milestone Decision Authority is required to submit notification of the waiver, together with the rationale, to the Comptroller General of the United States at the same time it is submitted to the congressional defense committees. WSARA further provides that no later than 60 days after receipt of a notification of a waiver, we are to review the rationale for the waiver and submit a written assessment of that rationale to the congressional defense committees.<sup>2</sup>

On November 27, 2012, we received notice from DOD that it had waived the competitive prototyping requirement for the Combat Rescue Helicopter (CRH). The Air Force's CRH

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<sup>1</sup>Pub. L. No. 111-23, § 203(a), as amended by the Ike Skelton National Defense Authorization Act for Fiscal Year 2011, Pub. L. No. 111-383, § 813. DOD modified its guidance related to the operation of its acquisition system through Directive-Type Memorandum (DTM) 09-027, “Implementation of Weapon System Acquisition Reform Act of 2009 (Dec. 4, 2009, incorporating Change 3, Dec. 9, 2011). Major defense acquisition programs are those estimated by DOD to require an eventual total expenditure for research, development, test, and evaluation of more than \$365 million, or for procurement, including all planned increments or spirals, of more than \$2.19 billion in fiscal year 2000 constant dollars. The Milestone Decision Authority for major defense acquisition programs is the Under Secretary of Defense for Acquisition, Technology and Logistics; the head of a DOD component; or if delegated the component acquisition executive.

<sup>2</sup>Pub. L. No. 111-23 § 203(b)(2).

program, formerly called HH-60 Recapitalization, is an effort to replace aging HH-60G Pave Hawk helicopters. The CRH's primary mission is to recover personnel from hostile or denied territory. It will also conduct humanitarian, civil search and rescue, disaster relief, and non-combatant evacuation missions. The program is the Air Force's second effort to replace the HH-60G. The first effort, the Combat Search and Rescue Replacement Vehicle (CSAR-X), was canceled in 2009. Since then, the Air Force has reduced the helicopter's combat radius, survivability, cabin space, payload, and airspeed requirements to lower the program's cost and ensure that no technology development was needed to satisfy these requirements.

In this report, we assess DOD's rationale for waiving the competitive prototyping requirement for CRH and the analysis used to support it. To conduct our assessment, we compared the rationale in the waiver to the WSARA requirement to determine the extent to which the waiver is consistent with the statute. In addition, we reviewed the Air Force's cost-benefit analysis, which provides the data and assumptions on which the waiver is based, the acquisition strategy, and other relevant documentation. We also submitted written questions to and interviewed DOD, Air Force, and CRH program officials to clarify information in this documentation, as necessary.

We conducted this performance audit from December 2012 to March 2013 in accordance with generally accepted government auditing standards. These standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

## **Results in Brief**

DOD's rationale for waiving WSARA's competitive prototyping requirement for CRH addresses one of the two bases provided in the statute; namely that the cost of producing competitive prototypes exceeds the expected life-cycle benefits (in constant dollars) of producing the prototypes. The CRH program's acquisition strategy, which anticipates integrating an existing, in-production and flight-proven aircraft with technologically mature subsystems, is consistent with this rationale. The Air Force believes that any technology risk reduction associated with, or potentially benefitting, the CRH program has already occurred during the efforts to develop these in-production aircraft. This includes any risk reduction that could be achieved through competitive prototyping. In granting the waiver, DOD also found reasonable the Air Force's conclusion that the estimated \$725 million cost of conducting competitive prototyping exceeded the maximum expected life-cycle benefits of \$12 million. However, the Air Force only evaluated one potential approach to implementing competitive prototyping, which involved funding two contractors for much of the program's system development. This resulted in a high cost estimate for competitive prototyping that is more than 10 times greater than the target unit cost of the helicopter. DOD's policy on economic analysis states that each feasible alternative for meeting an objective must be considered, and its life-cycle costs and benefits evaluated. The Air Force could have more fully evaluated the cost and benefits of additional prototyping strategies, including more limited approaches that are mentioned in WSARA or DOD's implementing memorandum, such as producing a single prototype or prototyping critical subsystems before Milestone B. The potential cost and benefits of these strategies were not included in the Air Force's supporting analysis. While there are questions about the methodology the Air Force used to evaluate the cost and benefits of competitive prototyping for the CRH program, the decision to not pursue prototyping may still be sound given the other actions that the Air Force has taken to reduce cost and risk on the program.

## **Waiver Rationale Is Consistent with WSARA, but Supporting Analysis Could Have More Fully Evaluated Additional Prototyping Strategies**

DOD's rationale for waiving WSARA's competitive prototyping requirement for CRH addressed one of the two bases provided for a waiver in the statute, namely that the cost of producing competitive prototypes exceeds the expected life-cycle benefits, including the benefits of improved performance and increased technological and design maturity that may be achieved through competitive prototyping.<sup>3</sup> The CRH program's acquisition strategy and market research are consistent with this rationale. According to the waiver, there is no technology development anticipated for the CRH program and the required capability can be met by modifying existing, in-production, and flight-proven aircraft. The Air Force believes that any technology risk reduction associated with, or potentially benefitting, the CRH program has already occurred during the efforts to develop these aircraft. This includes any risk reduction that could be achieved through competitive prototyping. According to the program office's market research, several mature aircraft and subsystems that are being used operationally could meet CRH requirements. All the aircraft would require modifications to integrate various subsystems, although the program expects the integration risks to be low to moderate. The CRH acquisition strategy anticipates the use of a fixed-price incentive contract for engineering and manufacturing development, which is consistent with this level of risk. The Air Force will not be able to completely validate the market research used to support the prototyping waiver until it completes the ongoing competition for the CRH development and production contract and holds key systems engineering reviews, which will not occur until after it receives Milestone B approval.

In the waiver, DOD found reasonable the Air Force's cost-benefit analysis, which concluded that competitively prototyping the CRH would increase development costs by approximately \$725 million (base year 2012 constant dollars) and yield life-cycle cost benefits of \$12 million or less (base year 2012 constant dollars). However, the Air Force only evaluated one potential approach to implementing competitive prototyping. Specifically, the Air Force estimated the costs and benefits of funding and managing a second contractor from Milestone B through most of system development and nearly up to the program's initial production decision by which point each contractor would have produced two test aircraft, developed software, and conducted the systems engineering efforts necessary to get through both a preliminary and critical design review. This results in a high cost estimate for competitive prototyping that is more than 10 times greater than the target unit cost of the helicopter in procurement. The Air Force could have more fully evaluated the cost and benefits of additional prototyping strategies, including more limited approaches that are mentioned in WSARA or DOD's implementing memorandum, such as producing a single prototype or prototyping critical subsystems before Milestone B. DOD's policy on economic analysis states that each feasible alternative for meeting an objective must be considered, and its life-cycle costs and benefits evaluated.<sup>4</sup> According to the Air Force's waiver request, awarding contracts before Milestone B for competitive prototypes, or requiring the program to produce a prototype before Milestone B approval, would significantly alter the program's acquisition strategy and delay program execution. It did not provide any

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<sup>3</sup>In the waiver, DOD also stated that the cost of producing a single prototype of the CRH or its critical subsystems before Milestone B exceeded the expected life-cycle benefits. WSARA provides that whenever a Milestone Decision Authority authorizes a competitive prototyping waiver, the program is still required to produce a prototype prior to Milestone B approval if the expected life-cycle benefits (in constant dollars) of producing such prototype exceed its cost and its production is consistent with achieving critical national security objectives. Pub. L. No. 111-23 § 203(a)(3)(A).

<sup>4</sup>DOD Instruction 7041.3, *Economic Analysis for Decisionmaking* (Nov. 7, 1995).

other information on the potential cost and benefits of these strategies in its waiver request.

The Air Force could have also considered a wider range of benefits in its analysis, including those related to maintaining competition. The life-cycle cost benefits in the Air Force's analysis were based on potential reductions in the program's systems integration and software development risk. The Air Force concluded that if the program was able to eliminate this risk through competitive prototyping, the estimated cost benefits would be \$12 million or less. It assumed these risk reduction benefits would only be realized after prototyping was completed. The Air Force also assumed that there would be little to no additional benefits associated with the competitive prototyping strategy it outlined in its analysis, which included maintaining competition beyond Milestone B. The CRH program office does not believe that competitive prototyping would result in lower production costs than its current strategy, which involves conducting a full and open competition for a single CRH development and production contract. In addition, according to the Air Force, the program's strategy of conducting only modest system and subsystem development and minimal hardware and software integration limits opportunities for contractors to develop changes that increase reliability, improve fuel efficiency, or otherwise reduce life-cycle costs, especially for systems, subsystems, and components that are in production and flight proven. While these assumptions may turn out to be valid for the CRH program, we have previously reported that maintaining competition may result in reduced costs or other positive outcomes to a program over time, including better performance, increased reliability, and improved contractor responsiveness.<sup>5</sup>

The Air Force did incorporate lessons learned from the Enhanced Polar System (EPS) competitive prototyping waiver—DOD's first—to improve certain aspects of the CRH cost-benefit analysis. In 2012, we reported the rationale for the EPS waiver was consistent with WSARA, but the cost-benefit analysis supporting it was incomplete.<sup>6</sup> That analysis failed to include a specific dollar value or range of values for the estimated life-cycle benefits of competitive prototyping. In the absence of an estimated life-cycle benefit, we stated that the Air Force could not conclusively determine whether the costs of competitive prototyping outweighed the benefits. We also noted in our EPS waiver assessment that the Air Force's estimate of the cost of competitive prototyping was prepared by the program office and not independently estimated or reviewed by other DOD cost estimating organizations. According to our best practices criteria, an independent cost estimate is considered one of the best and most reliable resource estimate validation methods because it provides an independent view of expected program costs that tests the program office estimate for reasonableness. The CRH cost-benefit analysis addressed both of these points. For example, the Air Force Cost Analysis Agency performed a cost assessment that validated the CRH program office estimate from which the cost-benefit analysis was derived. DOD's Office of Cost Assessment and Program Evaluation also reviewed the data and estimating methodology used to develop the overall CRH program office cost estimate and considered them reasonable.

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<sup>5</sup>GAO, *Defense Acquisitions: Analysis of Costs for the Joint Strike Fighter Engine Program*, GAO-07-656T (Washington, D.C.: Mar. 22, 2007).

<sup>6</sup>GAO, *Department of Defense's Waiver of Competitive Prototyping Requirements for Enhanced Polar System Program*, GAO-12-983R (Washington, D.C.: Aug. 23, 2012).

## Concluding Observations

While there are questions about the methodology the Air Force used to evaluate the cost and benefits of competitive prototyping for the CRH program, the decision not to pursue prototyping may still be sound. Recognizing that the intent of competitive prototyping is to reduce cost and risk, other actions taken by the Air Force have arguably achieved these goals. Specifically, its decision to significantly lower requirements, use an existing aircraft, competitively award the development and production contract, and employ fixed-price contracts are all material steps to reducing cost and risk on the CRH program.

## Agency Comments and Our Evaluation

We provided a draft of this report to DOD for comment. In its written comments, reproduced in the enclosure, DOD appreciated our conclusion that the rationale in the CRH competitive prototype waiver was consistent with WSARA. DOD agreed that its policy on economic analysis requires each feasible alternative to be considered, and its life-cycle costs be evaluated, but noted that WSARA does not specifically require detailed consideration of every possible prototyping strategy. Further, it stated that each competitive prototype waiver should be tailored for each specific program without causing undue burden to the program and service. In the case of the CRH, DOD believes the business case analysis was sufficient to meet the WSARA requirements and it was not in the best interest of the program or the Air Force to expend additional resources on an expanded analysis of alternatives that were infeasible and unwarranted given the technical maturity of the program. We agree that DOD should be able to tailor its competitive prototype waivers and supporting business case analyses for each specific program and the waiver process should not cause undue burden. However, in this case, the Air Force only evaluated one high-cost approach to implementing competitive prototyping, which involved funding two contractors for much of the program's system development. We believe that DOD, consistent with its policy on economic analysis, could have considered other lower-cost options for prototyping, which have the potential to increase DOD's knowledge and reduce risk prior to beginning system development. Considering even one such alternative may not have changed DOD's decision to waive the competitive prototyping requirement for the CRH program, but it would have provided a firmer basis for doing so.

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We are sending copies of this report to interested congressional committees, the Secretary of Defense, and the Secretary of the Air Force. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions, please contact me at (202) 512-4841 or [sullivanm@gao.gov](mailto:sullivanm@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report were Ron Schwenn, Assistant Director; J. Andrew Walker; Marie P. Ahearn; Kenneth E. Patton; and Carol Petersen.

A handwritten signature in black ink, appearing to read 'Michael J. Sullivan', with a stylized, flowing script.

Michael J. Sullivan  
Director, Acquisition and Sourcing Management

Enclosure

*List of Committees*

The Honorable Carl Levin  
Chairman  
The Honorable James Inhofe  
Ranking Member  
Committee on Armed Services  
United States Senate

The Honorable Richard J. Durbin  
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The Honorable Thad Cochran  
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House of Representatives

## Comments from the Department of Defense



ACQUISITION

ASSISTANT SECRETARY OF DEFENSE  
3015 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3015

022113

Mr. Michael J. Sullivan  
Director, Acquisition and Sourcing Management  
U.S. Government Accountability Office  
441 G Street, N.W.  
Washington, DC 20548

Dear Mr. Sullivan:

This is the Department of Defense (DoD) response to the Government Accountability Office (GAO) Draft Report, GAO-13-313R, "Department of Defense's Waiver of Competitive Prototyping Requirement for Combat Rescue Helicopter Program," dated January 25, 2013 (GAO Code 121113). The Department appreciates the effort of the GAO and the opportunity to comment on the draft report.

The Department further appreciates GAO's conclusions that the Combat Rescue Helicopter (CRH) Program rationale for the competitive prototype requirement waiver is consistent with the Weapon Systems Acquisition Reform Act (WSARA) of 2009, Public Law 111-23. We want to explain why it was not required by WSARA that the supporting analysis should have more fully evaluated the costs and benefits of additional prototyping strategies. The Department agrees that DoD's policy on economic analysis requires each feasible alternative be considered, and its life-cycle costs be evaluated, but notes that WSARA does not specifically require detailed consideration of every possible prototyping strategy.

The Department believes that each competitive prototype waiver should be tailored for each specific program without causing undue burden to the program and service in the development of the request. The Department further believes in preserving resources in an austere fiscal environment and that expanded analyses beyond what is deemed sufficient are not prudent and should not be expected as a norm.

In the case of the CRH, the Department believes the business case analysis was sufficient under the WSARA requirement and it was not in the best interest of the program or the Air Force to expend additional fiscal, manpower, or scheduling resources on an expanded analysis of alternatives that were infeasible. There are no planned critical subsystems that warrant competitive prototyping prior to milestone B and all have been judged technically mature.

Sincerely,

Katrina McFarland

(121113)

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