The Air Force Needs to Improve Cost-Effectiveness and Availability of the Joint Surveillance Target Attack Radar System

NOVEMBER 1, 2016
Mission
Our mission is to provide independent, relevant, and timely oversight of the Department of Defense that supports the warfighter; promotes accountability, integrity, and efficiency; advises the Secretary of Defense and Congress; and informs the public.

Vision
Our vision is to be a model oversight organization in the Federal Government by leading change, speaking truth, and promoting excellence—a diverse organization, working together as one professional team, recognized as leaders in our field.
Objective
We determined whether the Air Force made cost-effective purchases on the performance-based logistics contract to support the E-8C Joint Surveillance Target Attack Radar System (JSTARS) aircraft.

Background
The 116th and 461st Air Control Wings maintain a fleet of 16 E-8C aircraft and 1 E-8A aircraft trainer to conduct ground surveillance to support offensive operations and targeting and perform Battle Management, Command and Control missions. The E-8C JSTARS aircraft is a pre-owned modified Boeing 707-300 series aircraft loaded with radar, communication, and operations and control equipment.

On September 15, 2000, the Air Force Space and Special Systems awarded a cost-plus-award-fee contract to Northrop Grumman Corporation to provide Total System Support Responsibility services to sustain 16 E-8C JSTARS aircraft. These services include program management, engineer technical support, supply chain and spare parts management, flight crew training, technical data, and customer support. The Total System Support Responsibility contract is valued at $7 billion, with a 6-year base period and 16 annual contract option periods. We reviewed contract option periods 11.5 to 15, which cover May 2011 through October 2015. Contract option period 11.5 was not a full-year option due to delays in contract negotiations.

Finding
The JSTARS contracting officer did not promote cost-effectiveness on the Total System Support Responsibility contract for sustainment support of the E-8C JSTARS aircraft. This occurred because the JSTARS contracting officer did not:

- establish adequate oversight procedures to validate whether Northrop Grumman’s proposed over and above work was appropriate;
- establish an aircraft availability metric requirement that was consistently achieved and satisfied the Air Control Wing users’ need to have aircraft available for their mission;
- establish an appropriate cost performance incentive that is designed to motivate the contractor to reduce contract costs; and
- properly manage portions of the award fee allocated for aircraft availability and cost performance requirements.

As a result, the JSTARS contracting officer paid unallowable award fees totaling $7.6 million, which could have been put to better use. Also, the JSTARS program management office spent $1.1 billion from May 2011 through October 2015 for contract option periods 11.5 to 15 without achieving its acquisition objective to increase aircraft availability while reducing sustainment cost. Furthermore, the ability of the Air Control Wings to meet their mission was impacted because aircraft were not available. Additionally, the JSTARS program manager did not perform an analysis to determine whether it was more cost-effective to sustain an aging E-8C fleet or to use another platform for JSTARS.

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1 A cost-plus-award-fee contract is a cost-reimbursable contract that provides a fee for the contractor that consists of a base amount fixed at the beginning of the contract and an award amount based on an evaluation by the Government, sufficient to motivate the contractor to provide excellent performance on the contract.

2 Over and above work is work discovered while performing overhaul, maintenance, and repair efforts that, while within the general scope of the contract, is not covered by basic work contract line items but necessary to satisfactorily complete the contract.

3 Standard repairs refers to repair procedures included in Boeing’s repair manual for the 707 aircraft.
Results in Brief
The Air Force Needs to Improve Cost-Effectiveness and Availability of the Joint Surveillance Target Attack Radar System

Recommendations

We recommend that the Senior Center Contracting Official, Robins Air Force Base, direct the contracting officer to:

- verify the appropriateness of all contractor-proposed over and above work;
- establish evaluation criteria in the award-fee plan for contract option period 17 that adequately motivate Northrop Grumman to reduce contract costs;
- determine if the unallowable award fees paid from November 2013 through October 2015 during contract option periods 14 and 15, totaling $7.6 million, can be recovered through contractual remedies or a voluntary refund; and
- conduct periodic reviews of the JSTARS Total System Support Responsibility contract to ensure its compliance with the Federal Acquisition Regulation and Air Force guidance.

Additionally, we recommend that the Program Executive Officer for Battle Management:

- develop a requirement to determine the need for Government engineers to be located full-time at the Lake Charles Maintenance and Modification Center to provide technical support to the JSTARS contracting officer in determining whether contractor-proposed over and above work is appropriate; and
- direct the JSTARS program manager to perform a service-life study to determine if there are cost-effective options to sustain the aging fleet of E-8C aircraft to mitigate operational capability risks.

We also recommend that the Program Executive Officer for Battle Management direct the JSTARS program manager, with support from the JSTARS contracting officer, to revise the sustainment performance metric requirement on the follow-on contract for option period 17. Specifically, we recommend that the Air Force relate the availability requirement to the Air Control Wing user’s desired outcome for aircraft availability.

Management Comments and Our Response

Comments from the Program Executive Officer for Battle Management, in collaboration with the Senior Center Contracting Official, Robins Air Force Base, addressed all specifics of the recommendations and no further comments are required. Please see the Recommendations Table on the next page.
## Recommendations Table

<table>
<thead>
<tr>
<th>Management</th>
<th>Recommendations Requiring Comment</th>
<th>No Additional Comments Required</th>
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<tbody>
<tr>
<td>Senior Center Contracting Official, Robins Air Force Base</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Program Executive Officer for Battle Management</td>
<td></td>
<td>2, 3</td>
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MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR
ACQUISITION, TECHNOLOGY, AND LOGISTICS
ASSISTANT SECRETARY OF THE AIR FORCE
(FINANCIAL MANAGEMENT AND COMPTROLLER)


We are providing this report for information and use. The contracting officer did not promote cost-effectiveness on the performance-based contract for sustainment of the E-8C JSTARS aircraft and mismanaged the award fee, resulting in payments of $7.6 million that could have been put to better use. During contract option periods 11.5 to 15, the contracting officer spent $1.1 billion for a degraded mission capability while contract costs increased. We conducted this audit in accordance with generally accepted government auditing standards.

We considered management comments on a draft of this report when preparing the final report. Comments from the Program Executive Officer for Battle Management, in collaboration with the Senior Center Contracting Official, Robins Air Force Base, conformed to the requirements of DoD Directive 7650.03; therefore, we do not require additional comments.

We appreciate the courtesies extended to the staff. Please direct questions to me at (703) 604-9077 (DSN 664-9077).

Jacqueline L. Wicecarver
Assistant Inspector General
Acquisition and Sustainment Management
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Introduction

Objective
We determined whether the Air Force made cost-effective purchases on the performance-based logistics (PBL) contract to support the Joint Surveillance Target Attack Radar System (JSTARS). See Appendix A for scope and methodology and prior coverage related to the audit objectives.

Background

E-8C JSTARS Aircraft
The E-8C JSTARS aircraft, shown in Figure 1, is a pre-owned Boeing 707-300 series aircraft modified with radar, communications, and operations and control equipment. The Air Force purchased pre-owned Boeing 707-300 series aircraft with an average service age of 32 years and limited maintenance history. The 116th and 461st Air Control Wings maintain a fleet of 17 JSTARS aircraft, including 16 E-8C aircraft and 1 E-8A aircraft trainer, at Robins Air Force Base, Georgia. The Air Control Wings use the E-8C JSTARS aircraft to conduct ground surveillance to support offensive operations and targeting. Additionally, the Air Control Wings use the aircraft to perform Battle Management, Command and Control missions.

Figure 1. E-8C JSTARS Aircraft
Source: Air Force.
JSTARS Program Management

The Program Executive Officer (PEO) for Battle Management, headquartered at Hanscom Air Force Base, Massachusetts, reports to the Assistant Secretary of the Air Force (Acquisition). The PEO for Battle Management has two missions. The PEO is responsible for the JSTARS program and supports the Air Force Life Cycle Management Center (AFLCMC) by organizing, training and equipping the Battle Management directorate and its divisions. AFLCMC, headquartered at Wright-Patterson Air Force Base, Ohio, is responsible for the total life-cycle management of all aircraft, engines, munitions, and electronic systems. AFLCMCs mission is to provide affordable and sustainable capabilities to U.S. personnel and global partners, on time and at cost.

The mission of the PEO for Battle Management is to develop, acquire, and sustain capability to support:

- aerospace management,
- air operations command and control,
- mission planning,
- intelligence,
- theater battle control,
- airborne battle management,
- missile warning,
- space control sensors,
- joint operations and force application planning,
- force protection, and
- weather operations.

The Command and Control, Intelligence, Surveillance and Reconnaissance (C2ISR) Division is the subordinate activity under the PEO for Battle Management. The C2ISR Division is responsible for a variety of systems that collect, process, and disseminate intelligence information needed by national security and military officials. The JSTARS program management office (PMO), located at Robins Air Force Base, is responsible for oversight of the JSTARS program. The JSTARS PMO reports directly to the Chief, C2ISR Division.
Total System Support Responsibility Contract

On September 15, 2000, the Air Force Space and Special Systems awarded a contract<sup>4</sup> to Northrop Grumman Corporation to provide Total System Support Responsibility (TSSR) services to sustain the E-8C JSTARS aircraft. The TSSR services include program management, engineer technical support, supply chain and spare parts management, flight crew training, technical data, and customer support. The TSSR contract goals are to maximize aircraft availability and training effectiveness and reduce cost.

The TSSR contract is a cost-plus-award-fee contract,<sup>5</sup> valued at $7 billion, with a 6-year base period and 16 annual contract option periods. For this audit, we reviewed contract option periods 11.5 to 15, which covered May 2011 through October 2015. Contract option period 11.5 was not a full year due to delays in contract negotiations. Contract option period 16 began on November 1, 2015, and ends on October 31, 2016, while the follow-on contract option period 17 is scheduled to begin on November 1, 2016. The Air Force pays an award fee to Northrop Grumman based on successful performance in the following four weighted evaluation areas:

- aircraft availability,
- warfighter support,
- cost-performance-to-contract-estimate, and
- customer support.

(FOUO) The evaluation period for the award fee occurs two times per contract option period.

Review of Internal Controls

DoD Instruction 5010.40<sup>6</sup> requires DoD organizations to implement a comprehensive system of internal controls that provides reasonable assurance that programs are operating as intended and to evaluate the effectiveness of the controls. We identified internal control weaknesses related to cost-effective purchases made by the Air Force on the performance-based logistics (PBL) contract to support JSTARS. Specifically, the JSTARS contracting officer did not establish adequate oversight procedures to validate the appropriateness of proposed over

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<sup>4</sup> Contract F09603-00-D-0210.

<sup>5</sup> A cost-plus-award-fee contract is a cost-reimbursable contract that provides a fee for the contractor that consists of a base amount fixed at the beginning of the contract and an award amount based on a judgmental evaluation by the Government, sufficient to motivate the contractor to provide excellent performance on the contract.

and above repair work;⁷ establish an effective and consistently achieved aircraft availability metric requirement; or establish a cost-performance incentive that adequately motivated the contractor to reduce cost. Additionally, the JSTARS program manager did not perform an analysis to determine whether it was more cost-effective to sustain an aging E-8C fleet or use another platform for JSTARS. We will provide a copy of the report to the senior official responsible for internal controls in the Air Force.

⁷ Over and above work is work discovered while performing overhaul, maintenance, and repair efforts that, while within the general scope of the contract, is not covered by basic work contract line items, but is necessary to satisfactorily complete the contract.
Finding

Contracting for Sustainment of JSTARS Needs to Be More Effective

The JSTARS contracting officer did not promote cost-effectiveness on the TSSR contract for sustainment support of the E-8C JSTARS aircraft. This occurred because the JSTARS contracting officer did not:

- establish adequate oversight procedures to validate whether Northrop Grumman’s proposed over and above work for standard repairs was appropriate;
- establish an aircraft availability metric requirement that was consistently achieved and satisfied the 116th and 461st Air Control Wings’ need to have aircraft available for their mission;
- establish an appropriate cost performance incentive that is designed to motivate the contractor to reduce contract costs; and
- properly manage portions of the award fee allocated for aircraft availability and cost performance requirements.

As a result, the JSTARS contracting officer paid unallowable award fees totaling $7.6 million, which could have been put to better use. Also, we reviewed TSSR contract option periods 11.5 to 15 and determined that the JSTARS PMO spent $1.1 billion without achieving its acquisition objective to increase aircraft availability while reducing sustainment cost. Furthermore, the ability of the Air Control Wings to meet their mission was impacted because aircraft were not available. Additionally, the JSTARS program manager did not perform an analysis to determine whether it was more cost-effective to sustain an aging E-8C fleet or to use another platform for JSTARS.

Background on the E-8C JSTARS Aircraft Operating Environment

In October 1989, after Boeing’s closure of the 707 production line, the Defense Acquisition Board decided that the Air Force would purchase pre-owned Boeing 707-300C aircraft as the airframe (the body of the aircraft) for the JSTARS. The Air Force purchased the 707-300C aircraft, with limited maintenance histories, from multiple domestic and foreign government and commercial sources. The

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8 Standard repairs refers to repair procedures included in Boeing’s repair manual for the 707 aircraft.
(FOUO) Boeing 707-300C aircraft were converted to the E-8C aircraft to support the JSTARS mission. The E-8C aircraft conversion involved refurbishing the Boeing 707-300C airframe to bring it into compliance with Federal Aviation Administration mandates for aging aircraft. However, the conversion did not completely restore the service life of the airframes, which had an average service age of 32 years at the time of purchase. According to an Air Force E-8C assessment report, as the E-8C fleet’s service life has degraded, the over and above repair costs from the beginning to the end of each TSSR period of performance for TSSR contract option periods 11.5 to 15 have increased an average of $35 million annually.

As of December 22, 2015, the JSTARS PMO had paid $1.1 billion, which included over and above repair costs, to Northrop Grumman for TSSR contract option periods 11.5 to 15. The contract line item number charged for the over and above costs also included other costs, such as program depot maintenance, support for the trainer aircraft, and management of the technical publications. Table 1 shows the total contract costs for each TSSR option period from 11.5 to 15.

\[\text{Table 1. Total Contract Costs for TSSR Contract Option Periods 11.5 to 15 (as of December 22, 2015)}\]

<table>
<thead>
<tr>
<th>TSSR Contract Period</th>
<th>Expenses</th>
<th>Award-Fee</th>
<th>Contract Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.5</td>
<td>$102,652,035</td>
<td>$11,207,101</td>
<td>$113,859,136</td>
</tr>
<tr>
<td>12</td>
<td>206,075,760</td>
<td>23,379,679</td>
<td>229,455,439</td>
</tr>
<tr>
<td>13</td>
<td>199,430,310</td>
<td>22,678,275</td>
<td>222,108,585</td>
</tr>
<tr>
<td>14</td>
<td>207,367,647</td>
<td>26,562,840</td>
<td>233,930,487</td>
</tr>
<tr>
<td>15</td>
<td>263,089,359</td>
<td>30,218,320</td>
<td>293,307,679</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td><strong>$978,615,111</strong></td>
<td><strong>$114,046,215</strong></td>
<td><strong>$1,092,661,326</strong></td>
</tr>
</tbody>
</table>

Source: DoD OIG.

Despite the risks associated with the previous acquisition decision to purchase pre-owned aircraft, DoD Directive 5000.01 states that program managers must develop and implement PBL strategies that improve total system availability while minimizing cost and the size of spare parts inventory. Additionally, the Directive states that trade-off decisions involving cost, service life, and effectiveness must consider corrosion prevention and mitigation.

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9 Service life refers to the amount of time that an aircraft can fly before it can no longer fly or undergoes major rework.
Air Force Oversight of Over and Above Work for Standard Repairs Was Inadequate

The JSTARS contracting officer did not establish adequate oversight procedures to validate whether the contractor’s proposed over and above work for standard repairs at the Lake Charles Maintenance and Modification Center (LCMMC), Lake Charles, Louisiana, was appropriate. Instead, the JSTARS contracting officer inserted a TSSR contract clause\(^{12}\) that allowed Northrop Grumman to determine the over and above repairs required. However, the Defense Federal Acquisition Regulation Supplement 252.217-7028\(^{13}\) requires the administrative contracting officer to bilaterally or unilaterally establish over and above work procedures that cover Government review, verification, and authorization of the work. Specifically, the clause states that the Government must verify that the proposed over and above repair work is appropriate. Despite the Defense Federal Acquisition Regulation Supplement requirement, the Government did not verify the appropriateness of the over and above work for standard repairs performed under the TSSR contract.

According to the JSTARS PMO and officials at the Defense Contract Management Agency (DCMA), none of the contractor-proposed over and above work for standard repairs was validated for appropriateness. Northrop Grumman determined the over and above repairs that were needed, as stated in the TSSR contract clause. According to the clause, to streamline administration of over and above work, the JSTARS contracting officer and Northrop Grumman agreed to an estimated cost for over and above repair work within a specific level of effort\(^{14}\) prior to contract award.

For standard over and above repairs that exceeded the estimated level of effort and cost, JSTARS and DCMA officials evaluated whether the number of labor hours to perform the proposed over and above work was necessary. However, Government officials did not verify the appropriateness of the over and above work for standard repairs performed under the TSSR contract, as required. Figure 2 shows the over and above review process for standard repairs.


\(^{14}\) Level of effort is a specific amount of work performed before additional funding must be added to the contract.
According to the JSTARS PMO, 116th Air Control Wing, and DCMA officials, the JSTARS program lacked the necessary onsite Government engineering support at the LCMMC to effectively validate if the proposed work scope, such as replace or repair decisions, was appropriate.

The Senior Center Contracting Official at Robins Air Force Base should direct the contracting officer to revise the Total System Support Responsibility contract clause to establish a procedure for the contracting officer to verify the appropriateness of all contractor-proposed over and above work before
performance of the work, as required by the Defense Federal Acquisition Regulation Supplement 252.217-7028. Additionally, the Program Executive Officer for Battle Management should develop a requirement to determine the need for Government engineers to be located full-time at the Lake Charles Maintenance and Modification Center to provide technical support to the Joint Surveillance Target Attack Radar System contracting officer in determining whether contractor-proposed over and above work for standard repairs is appropriate.

Effective Aircraft Availability Metric Was Not Established

The JSTARS contracting officer did not establish an aircraft availability metric requirement that was consistently achieved and satisfied the 116th and 461st Air Control Wings’ need to have aircraft available for their mission. The contracting officer evaluated Northrop Grumman’s performance of aircraft availability by the number of actual days above or below the scheduled depot maintenance days (baseline days\(^{15}\)) agreed upon at the beginning of each contract performance period. The difference between actual days and scheduled days is known as the deviation in total aircraft possessed days (DAPDs). However, maintenance was rarely completed within the baseline days, and the metric did not relate to the user’s desired outcome to have \(\text{of } 16\) JSTARS E-8C aircraft available, making the aircraft availability metric requirement meaningless.

Maintenance Was Rarely Completed Within Baseline Days

The originally established number of baseline days was rarely achieved. For example in TSSR contract option period 14, Northrop Grumman met the original baseline days for only one of the six aircraft that were returned to the Air Force. Northrop Grumman rarely completed the maintenance and delivered the JSTARS E-8C aircraft within the baseline days without the JSTARS contracting officials approving schedule extensions and increasing the baseline days. The Defense Acquisition Guidebook\(^{16}\) states that sustainment metric requirements must be obtainable. Additionally, the guidance states that unrealistic requirements adversely affect the development process, result in unachievable performance levels, and drive higher acquisition and sustainment costs.

\(^{15}\) Baseline days refer to the number of maintenance days estimated before inspection, which are identified in the TSSR contract.

During TSSR contract option periods 11.5 to 15, aircraft were delivered 32 times for scheduled depot maintenance. Because the E-8C JSTARS fleet consists of 16 aircraft, this meant that some aircraft were delivered for maintenance multiple times during these contract option periods.

Additionally, the JSTARS contracting officials granted schedule extensions for 30 of the 32 scheduled depot maintenance repairs. During TSSR contract option periods 11.5 to 15, the average number of days that the modified delivery dates exceeded the original delivery date ranged from \( \text{[ ]} \). According to the TSSR contract and award fee plan, the JSTARS contracting officials may approve schedule extensions requested by the contractor, which increases the baseline days. For example, during contract option period 14, Aircraft 97-0200 had 119 baseline days and Northrop Grumman delivered the aircraft from maintenance in \( \text{[ ]} \); the resulting DAPD of \( \text{[ ]} \) would be rated as unsatisfactory contractor performance. However, when the JSTARS contracting officials approved Northrop Grumman’s request to extend the schedule maintenance days to 244 days, the recalculated DAPD was \( \text{[ ]} \). For this example, according to the award fee plan, Northrop Grumman’s performance was rated as excellent. The excellent performance rating made Northrop Grumman eligible to earn more award fee.

When the JSTARS contracting officials approved schedule extensions and modified the contract to revise the original baseline days during TSSR contract option periods 11.5 to 14, Northrop Grumman was able to deliver aircraft within an acceptable range of the revised baseline days on average. For example, in contract option period 14, Northrop Grumman delivered aircraft in an average of \( \text{[ ]} \). The originally established average baseline was 119 days, which would have resulted in an unsatisfactory performance of \( \text{[ ]} \) after the originally established baseline. However, the JSTARS contracting officials approved schedule extensions that revised the average baseline to \( \text{[ ]} \), which resulted in an excellent performance of 3 days after the revised baseline. Figure 3 shows Northrop Grumman’s average actual delivery days compared to the average original and revised baseline days for TSSR contract option periods 11.5 to 14.

\( \text{[ ]} \) We did not include TSSR contract option period 15 in the analysis because only one of seven aircraft in scheduled depot maintenance had been delivered as of March 4, 2016.
Figure 3. Northrop Grumman’s Average Performance in Delivering Aircraft for TSSR Contract Option Periods 11.5 to 14

Note: Average days were used because more than one aircraft was in scheduled depot maintenance during a given contract option period.

Source: DoD OIG.

For TSSR contract option period 15, the JSTARS contracting officials approved schedule extensions for six of seven aircraft. However, Northrop Grumman has not completed maintenance or delivered any of the seven aircraft within the original baseline days or revised baseline days. As of March 4, 2016, six of seven aircraft were undergoing maintenance and had not been delivered. See Figure 4 for an illustration of Northrop Grumman’s actual delivery days compared to the original and revised baseline days.
Finding

Figure 4. Northrop Grumman’s Performance in Delivering Aircraft for TSSR Contract Option Period 15 (as of March 4, 2016)

Note: (FOUO) Only JSTARS aircraft 86-0416 was delivered during contract option period 15. Source: DoD OIG.

Availability Metric Needs to Relate to User’s Desired Outcomes

Contractor performance on the TSSR contract was not measured against the Air Control Wing user’s desired outcome. PBL guidance states that PBL arrangements are tied to warfighter outcomes and integrate the various product support activities of the supply chain with appropriate incentives and metrics. One of the principles of PBL is to use measurable and manageable metrics that accurately assess the product support provider’s performance against warfighter defined needs. Additionally, the PBL Guidebook states that one of the most important considerations for selecting metrics is to understand how they link and contribute to performance outcomes.

(FOUO) According to the Air Control Wing user, the desired outcome was that of 16 E-8C aircraft be available for training and missions at all times, with no more than aircraft in scheduled depot maintenance at any given time. However, as discussed previously, aircraft availability was measured based on the number of actual days above or below baseline days, which the contracting

(FOUO) officials consistently revised through schedule extension approvals and contract modifications. Due to contractor-proposed over and above work and JSTARS contracting officials-approved schedule extensions, the number of aircraft in scheduled depot maintenance on average increased monthly during TSSR contract option periods 11.5 to 15. In TSSR contract option period 15, the 116th and 461st Air Control Wings performed monthly missions and training with 11 of 16 E-8C aircraft because Northrop Grumman had a monthly average of 5 aircraft in scheduled depot maintenance. In October of TSSR contract option period 15, the Air Control Wings had only nine available aircraft, because seven aircraft were in scheduled depot maintenance. See Appendix B for details on the number of aircraft in scheduled depot maintenance per month for TSSR contract option periods 11.5 to 15. According to an Air Control Wing official, the number of aircraft in scheduled depot maintenance increased to as many as eight during TSSR contract option period 16.

The Program Executive Officer for Battle Management should direct the JSTARS program manager, with support from the contracting officer, to revise the sustainment metric requirement on the follow-on contract for Total System Support Responsibility contract option period 17 to link the aircraft availability metric requirement to the Air Control Wing user’s desired outcome for aircraft availability in accordance with the Performance-Based Logistics Guidebook.

**Cost Performance Incentive Needs Improvement**

(FOUO) The JSTARS contracting officer did not establish a performance incentive that adequately motivated the contractor to reduce cost and that discouraged contractor inefficiency and waste, as required by the Federal Acquisition Regulation (FAR). The FAR states that incentive contracts are designed to obtain specific acquisition objectives by including appropriate incentive arrangements designed to motivate contractor efforts that might not otherwise be emphasized and discourage contractor inefficiency and waste. The JSTARS contracting officer established performance incentives to achieve improved cost-performance-to-contract-estimate requirements. According to the TSSR award fee plan, the cost performance incentive was intended to encourage the contractor to manage authorized work within the authorized funding and to identify potential cost underruns. The contracting officer measured cost-performance-to-contract-estimate every 6 months by dividing the contractor’s estimate at completion (EAC) by the negotiated contract estimate for the annual performance period.

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20 (FOUO) The estimate at completion is a calculation of incurred cost at contract completion based on actual costs incurred at the time of reporting. The estimate at completion is reported by Northrop Grumman’s financial system.
In TSSR contract option period 16, the JSTARS contracting officer made 22 percent of the total award fee available for contractor cost performance. The contracting officer established an incentive metric, which pays the contractor 40 to 70 percent of the available award fee, when the EAC exceeded the contract cost estimate by 101 to 104 percent. See Table 2 for the award fee criteria for cost-performance-to-contract-estimate in TSSR contract option period 16.

Table 2. Cost-Performance-to-Contract-Estimate Metric for TSSR Contract Option Period 16

<table>
<thead>
<tr>
<th>Cost-Performance-to-Contract Estimate (Percent)</th>
<th>Award Fee for Cost Performance Portion (Percent)</th>
<th>Performance Rating</th>
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<tbody>
<tr>
<td>97 or below</td>
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<td>Excellent</td>
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<td>98</td>
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<td>103</td>
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<td>Satisfactory</td>
</tr>
<tr>
<td>104</td>
<td>40</td>
<td>Satisfactory</td>
</tr>
</tbody>
</table>

Note: The Air Force and Northrop Grumman agreed that 22 percent of the total award fee pool would be available for satisfactory to excellent cost performance. The column percentages apply to the cost performance portion of the total award fee pool.


Based on past cost performance, the JSTARS contracting officer did not adequately motivate the contractor to be more efficient by allowing the contractor to earn award fee for EAC ranging from 101 to 104 percent of the contract cost estimate. During previous TSSR award fee evaluation periods 11-1 to 15-2, Northrop Grumman’s EAC ranged from of the contract cost estimate. See Table 3 for Northrop Grumman’s past cost-performance-to-contract-estimate.

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21 The JSTARS contracting officer evaluated cost performance-to-contract estimates every 6 months and the evaluation period identified which 6-month period was being evaluated. For example TSSR award fee evaluation period 15-1 represented the first 6 months of the year and period 15-2 represented the remaining 6 months.
Table 3. Northrop Grumman’s Actual Cost-Performance-to-Contract-Estimate (TSSR Award Fee Evaluation Periods 11-1 through 15-2)

<table>
<thead>
<tr>
<th>Award Fee Evaluation Period</th>
<th>Cost-Performance-to-Contract Estimate (Percent)</th>
<th>Performance Rating</th>
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</thead>
<tbody>
<tr>
<td>11-1</td>
<td></td>
<td>Excellent</td>
</tr>
<tr>
<td>11-2</td>
<td></td>
<td>Excellent</td>
</tr>
<tr>
<td>12-1</td>
<td></td>
<td>Excellent</td>
</tr>
<tr>
<td>12-2</td>
<td></td>
<td>Excellent</td>
</tr>
<tr>
<td>13-1</td>
<td></td>
<td>Excellent</td>
</tr>
<tr>
<td>13-2</td>
<td></td>
<td>Excellent</td>
</tr>
<tr>
<td>14-1</td>
<td></td>
<td>Excellent</td>
</tr>
<tr>
<td>14-2</td>
<td></td>
<td>Excellent</td>
</tr>
<tr>
<td>15-1</td>
<td></td>
<td>Excellent</td>
</tr>
<tr>
<td>15-2</td>
<td></td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Source: DoD OIG.

Based on Northrop Grumman’s past performance, the contracting officer should have established a metric that would encourage the contractor to continue or exceed its level of performance exhibited during TSSR award fee evaluation periods 11-1 through 15-2. The Senior Center Contracting Official, Robins Air Force Base, should direct the JSTARS contracting officer to establish evaluation criteria in the award-fee plan for TSSR contract option period 17 that adequately motivate Northrop Grumman to reduce cost and discourage inefficiency in accordance with FAR 16.401(a)(2)(ii).

Management of Award Fee Portions Was Inadequate

The JSTARS contracting officer did not properly manage portions of the award fee allocated for aircraft availability and cost performance requirements, which resulted in Northrop Grumman receiving award fees of $7.6 million in TSSR contract periods 14 and 15 that could have been realized as Air Force cost savings. In TSSR contract option periods 14 and 15, the contracting officer set specific guidelines, which allowed the contractor to earn more than 100 percent of the available award fee for excellent performance by realigning unexpended funds from other contract line items to the award fee contract line.
item. The contracting officer’s actions to transfer cost underruns into contractor award fees undermine the Air Force’s goal of realizing savings. Furthermore, the contracting officer did not comply with the FAR and Air Force Award Fee guidance, which state that the maximum award fee available for contractor performance is 100 percent.

In TSSR contract option periods 14 and 15, the contracting officer offered award fees totaling $12.7 million and $8.5 million, respectively, to Northrop Grumman if aircraft were successfully delivered from maintenance within specified periods of the baseline days. According to the award fee plans, Northrop Grumman could earn 102 to 162 percent of the available award fee allocated to aircraft availability when the contractor delivered aircraft within 1 to 25 days before the scheduled delivery date. See Table 4 for details on the award fee criteria for excellent aircraft availability performance in TSSR contract option periods 14 and 15.

Table 4. TSSR Contract Option Periods 14 and 15 Award Fee Criteria for Excellent Aircraft Availability Performance

<table>
<thead>
<tr>
<th>Award Fee for Aircraft Availability Performance Portion (Percent)</th>
<th>Deviation in Total Aircraft Possessed Days</th>
<th>Performance Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>132-162</td>
<td>13-25</td>
<td>Excellent</td>
</tr>
<tr>
<td>117-130</td>
<td>7-12</td>
<td>Excellent</td>
</tr>
<tr>
<td>107-115</td>
<td>3-6</td>
<td>Excellent</td>
</tr>
<tr>
<td>102-105</td>
<td>1-2</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Note: The Air Force and Northrop Grumman agreed that 45 percent of the total award fee pool would be allocated for satisfactory to excellent aircraft availability performance in contract option period 14 and 40 percent in contract option period 15. The column percentages apply to the availability performance portion of the total award fee pool.


Additionally, in TSSR contract option periods 14 and 15, the contracting officer offered award fees totaling $12.7 million and $6.4 million, respectively, to Northrop Grumman if the EAC was within specified percentages of the contract cost estimate. According to the award fee plans, Northrop Grumman could earn 110 to 162 percent of the available award fee allocated to cost performance when

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22 FAR 16.401(e)(3)(iv).
The contractor’s EAC was within 89 to 95 percent of the contract cost estimate. See Table 5 for details on the award fee criteria for cost performance in TSSR contract option periods 14 and 15.

Table 5. Award Fee Criteria for Excellent Cost-Performance-to-Contract-Estimate (TSSR Contract Option Periods 14 and 15)

<table>
<thead>
<tr>
<th>Cost-Performance-to-Contract Estimate (Percent)</th>
<th>Award Fee for Cost Performance Portion (Percent)</th>
<th>Performance Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>89</td>
<td>162</td>
<td>Excellent</td>
</tr>
<tr>
<td>90</td>
<td>160</td>
<td>Excellent</td>
</tr>
<tr>
<td>91</td>
<td>150</td>
<td>Excellent</td>
</tr>
<tr>
<td>92</td>
<td>140</td>
<td>Excellent</td>
</tr>
<tr>
<td>93</td>
<td>130</td>
<td>Excellent</td>
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<td>94</td>
<td>120</td>
<td>Excellent</td>
</tr>
<tr>
<td>95</td>
<td>110</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Note: The Air Force and Northrop Grumman agreed that 45 percent of the total award fee pool would be available for satisfactory to excellent cost performance in contract option period 14 and 30 percent in contract option period 15. The column percentages apply to the cost performance portion of the total award fee pool.


In TSSR contract option period 16, the JSTARS contracting officer took corrective action and capped the available award fee pool allocated for cost performance and aircraft availability at 100 percent for an excellent performance rating. However, during TSSR contract option periods 14 and 15, the JSTARS contracting officer mismanaged the award fee pool, which resulted in the Air Force paying award fees, totaling $7.6 million to Northrop Grumman when it could have been realized as Air Force cost savings on the TSSR contract or put to better use. Therefore, the contracting officer should seek recovery of the award fee payments through all available contractual remedies. Appendix C shows the unallowable award fees paid in contract options periods 14 and 15.
A TSSR contract clause, “Procedures for Disputes Resolution by Alternate Disputes Resolution Process,” establishes procedures for resolving any issue, disagreement, or dispute due to an interpretation of the TSSR contract, or stemming from the operation of the award fee plan, award term plan, or partnering agreement, or becomes part of the contract with the scope of individual orders. The Air Force and Northrop Grumman agreed to use the dispute resolution process before initiating any formal judicial or other dispute resolution process. However, according to the Defense Acquisition Regulation Supplement, Procedure, Guidance, and Information, if legal counsel determines that contractual remedies are not readily available, the contracting officer may solicit voluntary refunds when the contractor’s retention of the amount in question would be contrary to good conscience and equity.

Therefore, the Senior Center Contracting Official, Robins Air Force Base, should direct the JSTARS contracting officer to determine if the unallowable award fees paid during TSSR contract option periods 14 and 15, totaling $7.6 million, can be recovered through the “Procedures for Disputes Resolution By Alternate Disputes Resolution Process” clause in the TSSR contract. If a contractual remedy is not available, the contracting officer should seek a voluntary refund in accordance with Defense Federal Regulation Supplement, Procedure, Guidance, and Information 242.71. Additionally, the Senior Center Contracting Official, Robins Air Force Base, should direct the JSTARS contracting officer to conduct periodic reviews of the JSTARS TSSR contract to ensure its compliance with the FAR and Air Force guidance.

Sustainment Strategy for an Aging Fleet Needs Analysis

The JSTARS program manager did not perform an analysis to determine whether it was more cost-effective to sustain an aging E-8C fleet or to use another platform for JSTARS. The Air Force performed a business case analysis in March 2007 to determine whether the cost-plus-award-fee TSSR contract was delivering the performance-based logistics goals of increased readiness and reduced-life-cycle cost and inventory. However, the business case analysis did not include an alternative airframe study to evaluate whether sustaining the pre-owned and aging E-8C fleet was the most cost-effective option. The alternative airframe study should consider the remaining aircraft service life, over and above repair cost growth, and the full production schedule of the replacement Next-Generation JSTARS Recapitalization Program, an upgrade to the legacy JSTARS program.

**E-8C Aircraft Service Life Degrades as Repair Costs Increase**

As the E-8C fleet’s service life diminishes, the over and above repair costs have significantly increased. As of August 2015, the average age of the E-8C airframe was 47 years. According to the JSTARS PMO, the E-8C aircraft leads Air Force-wide fleets in hours flown with 58,000 hours. Additionally, according to the 116th Air Control Wing Vice Commander, the fleet has a diminishing service life that would leave the Wing with only two aircraft fit to fly by the end of the TSSR contract performance period in 2022. See Figure 5 for the estimated diminishing service life of the JSTARS aircraft.

*Figure 5. E-8C JSTARS Aircraft Remaining Service Life*

Source: DoD OIG.

For E-8A JSTARS Aircraft 86-0416, used for training, the PEO for Battle Management accepted serious flight risks and returned the aircraft to service on two occasions. In November 2010, the aircraft reached the E-8C design goal and certified service life of 20,000 flight hours, but the PEO returned the aircraft to service based on Technical Airworthiness Authority engineer review results. Specifically, in February 2014, Aircraft 86-0416 was grounded because its flight hours were approaching the high-risk threshold of 125 percent of the 20,000-hour certified service life. And in December 2015, the PEO accepted the risk as serious and again returned the aircraft to service.
Additionally, the over and above repair costs from the beginning of each TSSR period of performance to the end of TSSR contract option periods 11.5 to 15 have increased an average of $35 million annually. An alternative airframe study would help to determine whether it is cost-effective to continue to sustain the aging fleet of E-8C aircraft or to use another platform to support the JSTARS. See Figure 6 for over and above cost increases for TSSR contract option periods 11.5 to 15.

*Figure 6. Over and Above Cost Growth for TSSR Contract Option Periods 11.5 to 15*

Source: DoD OIG.

**Solution Needed Until Next-Generation JSTARS Recapitalization Program Production**

When selecting an alternative airframe to support the current JSTARS, the JSTARS program manager needs to make sure that the airframe can support JSTARS mission until the Next Generation JSTARS Recapitalization Program reaches full production. According to a House of Representatives committee report, Congress is aware of the need to replace the current E-8C JSTARS aircraft due to problematic low availability rates, end of service life issues, and increasing

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sustainment cost. However, the Next Generation JSTARS is in the early stages of research and development and full operational capability is scheduled for several years after 2023. Moreover, Public Law 114-92\(^{26}\) prohibits the Air Force from using fiscal years 2016 and 2017 appropriated funds to retire the E-8C JSTARS aircraft, unless the Secretary of the Air Force determines, on a case-by-case basis, that an individual aircraft is not operational because of mishaps, or other damage, or is uneconomical to repair. Based on the aircraft ages, service life degradation, and growing over and above repair costs, exceptions to retirement are likely to apply. The current JSTARS operational requirements may need an alternative supporting platform until the Next Generation JSTARS Recapitalization Program is in full production.

The Program Executive Officer for Battle Management should direct the Joint Surveillance Target Attack Radar System program manager to perform a service-life study to determine if there are cost-effective options to sustain the aging fleet of E-8C aircraft to mitigate operational capability risks until the Next Generation Joint Surveillance Target Attack Radar System Recapitalization Program achieves full production.

**Conclusion**

As a result of the acquisition decision to refurbish pre-owned Boeing 707-300C aircraft with limited maintenance history into E-8C JSTARS aircraft, the JSTARS PMO is faced with significant challenges to maximizing aircraft availability and reducing cost. However, the following management actions to reduce costs are within the control of the JSTARS contracting officer and program manager:

- establishing adequate oversight procedures for over and above repairs;
- establishing cost performance incentives; and
- performing an alternative airframe study to identify the most cost-effective airframe platform to support the JSTARS.

Additionally, as the user, the Air Control Wings’ mission requirements must be supported by effective program management and contracting. Specifically, the JSTARS contracting officer must develop a consistently achievable aircraft availability metric requirement to measure the contractor’s effectiveness in supporting mission requirements. Without these management actions, the JSTARS PMO will continue to pay Northrop Grumman reimbursable expenses and award fees, which have totaled $1.1 billion for TSSR contract option periods 11.5 to 15, without receiving the contract deliverables.

Recommendations, Management Comments, and Our Response

Revised Recommendation

As a result of management comments, we revised draft Recommendation 2.b to recommend that a life cycle study be performed to determine cost-effective options to sustain the aging E-8C fleet to mitigate operational capability risks. According to the Chief, C2ISR Division, the original recommendation to perform an alternative airframe study would require too much time and would not be cost-effective. Specifically, the Chief stated that the extensive re-engineering, modification, and testing efforts required for an alternative airframe study would take as much time as the engineering, manufacturing, and development phase for the Next Generation JSTARS Recapitalization Program. Additionally, according to the Chief, the process to obtain funding for an alternative airframe would be too time-consuming. The Chief stated that the Next Generation JSTARS Recapitalization Program would be approaching full operating capability by the time funding was secured for an alternative airframe. Furthermore, the Chief stated that the required developmental and procurement funding for an alternative airframe would deplete resources needed for the Next Generation JSTARS Recapitalization Program.

Recommendation 1

We recommend that the Senior Center Contracting Official, Robins Air Force Base, require the contracting officer to:

a. Revise the Total System Support Responsibility contract clause to establish a procedure for the contracting officer to verify the appropriateness of all contractor-proposed over and above work before performance of the work as required by the Defense Federal Acquisition Regulation Supplement 252.217-7028.

Department of the Air Force Comments

The PEO for Battle Management, responding in collaboration with the Senior Center Contracting Official, Robins Air Force Base, agreed with the recommendation. The PEO stated that he would approve all corrective actions implemented and certified by the C2ISR Division Chief.

The PEO for Battle Management stated that the purpose of the TSSR contract was for the contractor to have depot-level responsibility for JSTARS according to the terms of the contract. Specifically, the PEO stated that the contractor would be
Finding

responsible for daily management, direction, and control of program activities and resources. The PEO stated that, although language from the Defense Federal Acquisition Regulation Supplement 252.217-7028 was not included in the contract, the Air Force developed special clause H-953 to define the required repair work procedures, negotiated rates, and factors for repairs identified during maintenance. Additionally, the PEO stated that the contracting officer would request more DCMA oversight to refine the review process for the unanticipated repairs requested by Northrop Grumman for TSSR contract option period 17. The PEO stated that the Air Force would request the DCMA to review the appropriateness of the requested work, proposed hours, and bill of material. Furthermore, the PEO stated that the contracting officer would revise special clause H-953 to reflect the revised review procedures by October 31, 2016.

Our Response
Comments from the PEO for Battle Management addressed all specifics of the recommendation, and no further comments are required.

b. Establish evaluation criteria in the award-fee plan for Total System Support Responsibility contract option period 17 that adequately motivate Northrop Grumman to reduce cost and that discourage inefficiency, in accordance with Federal Acquisition Regulation 16.401(a)(2)(ii).

Department of the Air Force Comments
The PEO for Battle Management, responding in collaboration with the Senior Center Contracting Official, Robins Air Force Base, agreed with the recommendation. The PEO stated that the contracting officer does not develop the award fee plan or determine the fee, but the contracting officer is a member of the award fee review board. Additionally, the PEO stated that the fee-determining official approves the award fee plan and decides the award fee. The PEO stated that the C2ISR Division will make significant changes, including cost metric revisions, to the award fee plan for TSSR contract option year 17 by October 31, 2016.

Our Response
Comments from the PEO for Battle Management addressed all specifics of the recommendation, and no further comments are required.
c. Determine if the unallowable award fees paid during Total System Support Responsibility contract option periods 14 and 15, totaling $7.6 million, can be recovered through either the “Procedures for Disputes Resolution by Alternate Disputes Resolution Process” clause in the Total System Support Responsibility contract or voluntary refund in accordance with Defense Federal Regulation Supplement, Procedure, Guidance, and Information 242.71.

**Department of the Air Force Comments**

(FOUO) The PEO for Battle Management, responding in collaboration with the Senior Center Contracting Official, Robins Air Force Base, agreed with the recommendation. The PEO stated that the program office attempted to incentivize the contractor to repair the aircraft at a faster rate and reduce cost during 2014 and 2015. Additionally, the PEO stated that the fee determining official allowed more than 100 percent of the award fee to be earned based on the terms of the award fee plan. The PEO stated that the JSTARS contracting officer would consult with legal counsel to determine if requesting the recovery of $7.6 million is appropriate and achievable through the disputes clause in the TSSR contract or Defense Federal Acquisition Regulation Supplement, Procedure, Guidance, and Information 242.7100. The PEO gave an estimated completion date of September 15, 2017.

**Our Response**

Comments from the PEO for Battle Management addressed all specifics of the recommendation, and no further comments are required.

**d. Conduct periodic reviews of the Joint Surveillance Target Attack Radar System Total System Support Responsibility contract to ensure its compliance with the Federal Acquisition Regulation and Air Force guidance.**

**Department of the Air Force Comments**

The PEO for Battle Management, responding in collaboration with the Senior Center Contracting Official, Robins Air Force Base, agreed with the recommendation. The PEO stated that the contracting officer would make sure that the TSSR contract complies with FAR and Air Force guidance. The PEO stated that terms and conditions included in the contract at the time of award remain in effect unless a statute or regulation requires a change. The PEO stated that annual task orders under the TSSR contract are subject to business and contract approval.
requirements in accordance with Air Force Federal Acquisition Regulation Supplement 5301.90(a)(7). According to the PEO, the objectives of the contract approval process are to make sure that:

- contract actions effectively implement approved acquisition strategies;
- negotiations and contract actions result in fair and reasonable business arrangements;
- negotiations and contract actions are consistent with laws, regulations, and policies; and
- an independent review and assessment for the proposed contract action is accomplished.

The PEO stated that prior to task order issuance, legal and contract policy reviews are conducted to ensure compliance with FAR and Air Force guidance.

Our Response
Comments from the PEO for Battle Management addressed all specifics of the recommendation, and no further comments are required.

Recommendation 2
We recommend that the Program Executive Officer for Battle Management:

a. Develop a requirement to determine the need for Government engineers to be located full-time at the Lake Charles Maintenance and Modification Center to provide technical support to the Joint Surveillance Target Attack Radar System contracting officer in determining whether contractor-proposed over and above work is appropriate.

Department of the Air Force Comments
The PEO for Battle Management agreed with the recommendation. The PEO stated that the contractor was in total control of airframe maintenance, including appropriate over and above work, with minimal Government oversight. The PEO stated that as a result, the program office was not staffed to provide onsite depot technical support. The PEO stated that the C2ISR Division has requested additional DCMA and program office manpower to provide on-site depot technical support. Since December 2015, the program office has increased temporary duty visits to the depot. Additionally, the PEO stated that the program office added in-depth reviews of aircraft undergoing maintenance. The PEO stated that Government engineers have supported major milestone events such as the E-8 corrosion survey, fuels symposium, and aircraft gate reviews.
**Our Response**

Comments from the PEO for Battle Management addressed the specifics of the recommendation, and no further action is required.

b. **Direct the program manager for the Joint Surveillance Target Attack Radar System to perform a service-life study to determine if there are cost-effective options to sustain the aging fleet of E-8C aircraft to mitigate operational capability risks until the Next Generation Joint Surveillance Target Attack Radar System Recapitalization Program achieves full production.**

**Department of the Air Force Comments**

The PEO for Battle Management agreed with the recommendation. The PEO stated that the fuselage is one of the primary service-life limiting structures on the E-8C aircraft. Additionally, the PEO stated that widespread fatigue damage of the fuselage is a concern due to the age of the E-8C aircraft. The PEO stated that in February 2016, the C2ISR Division asked Boeing to perform a widespread fatigue damage study on sections of the fuselage. The study is scheduled to be completed by March 2017. The PEO stated that the C2ISR Division will use the results of the study to determine the requirements to extend the E-8C service life. The PEO stated that the determination would include funding requirements and schedules to keep the fleet operational during service-life extension activities. The PEO gave an estimated completion date of May 1, 2017.

**Our Response**

Comments from the PEO for Battle Management addressed the specifics of the recommendation, and no further action is required.

**Recommendation 3**

We recommend that the Program Executive Officer for Battle Management direct the Joint Surveillance Target Attack Radar System program manager, with support from the Joint Surveillance Target Attack Radar System contracting officer, to revise the sustainment metric requirement on the follow-on contract for Total System Support Responsibility contract option period 17 to link the aircraft availability metric requirement to the Air Control Wing user’s desired outcome for aircraft availability in accordance with the Performance Based Logistics Guidebook.
**Department of the Air Force Comments**

The PEO for Battle Management agreed, stating that the C2ISR Division has proposed changing TSSR contract option period 17 aircraft availability award fee criteria from a DAPD to a work-in-progress metric. The PEO stated the change to a work-in-progress metric will directly relate Northrop Grumman’s award fee to the user’s requirement for three aircraft in depot. According to the PEO, the work-in-progress metric will be the heaviest weighted award fee evaluation factor at 75 percent. The PEO stated that the award fee criteria for TSSR contract option period 17 will be implemented by October 31, 2016.

**Our Response**

Comments from the PEO for Battle Management addressed all the specifics of the recommendation, and no further action is required.
Appendix A

Scope and Methodology

We conducted this performance audit from September 2015 through October 2016 in accordance with generally accepted government auditing standards. Those 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.

Interviews and Documentation

To determine whether the Air Force was efficient on the TSSR contract to support the JSTARS program, we met with officials from:

- JSTARS Branch of the Battle Management Directorate within the Air Force Life Cycle Management Command at Robins Air Force Base;
- 116th and 461st Air Control Wings at Robins Air Force Base;
- DCMA, Aircraft Integrated Maintenance Operations at Lake Charles, Louisiana; and

We reviewed the TSSR contract and related modifications dated from September 2000 to December 2015. We also reviewed award fee plans; award fee determinations briefings; documents related to the scheduled maintenance days and actual days; inspection assessment briefing and letter; DCMA manufacturing and production surveillance plan; and DCMA reviews of additional funding requests for unanticipated repairs and schedule extensions. In addition, we reviewed the following guidance related to sustainment strategy, over and above repairs, metrics, and award fee:

- Public Law 114-92;
- Federal Acquisition Regulation 16.401;
- Defense Federal Acquisition Regulation Supplement 242.71 and 252.217-7028;
- Defense Acquisition Guidebook;
- Performance Based Logistics Guidebook;
- Air Force Instruction 63-101/20-101; and
- Department of the Air Force Award-Fee Guide.
Use of Computer-Processed Data

We did not use computer-processed data to perform this audit.

Prior Coverage

During the last 5 years, the Government Accountability Office (GAO) and the Department of Defense Inspector General (DoD IG) issued five reports discussing JSTARS or performance metrics. Unrestricted GAO reports can be accessed at http://www.gao.gov. Unrestricted DoD IG reports can be accessed at http://www.dodig.mil/pubs/index.cfm.

**GAO**


The report recommended that DoD develop lessons learned for long-term maintenance contracts, including the JSTARS sustainment contract, regarding incentives and cost-control tools that the DoD could use.

**DoD IG**


The report recommended that the Air Force Life Cycle Management Center review the metrics in the F119 engine sustainment contract to verify that the incentive fees were accurate as of 2010 and take appropriate action to correct any potential underpayments or overpayments.


The report recommended that the Tactical Airlift Division for the C-130J program establish and monitor an appropriate inventory control metric in the performance-based logistics contract for the sustainment of the C-130 Hercules aircraft.


The report recommended that the Project Management Office for Stryker Brigade Combat Team establish and monitor appropriate cost and inventory control metrics if a performance-based logistics services contract is used for sustainment of the Stryker vehicles.

The report recommended that Army Aviation and Missile Life Cycle Management Command include appropriate metrics for eliminating excess DoD inventory if the contractor is responsible for managing the inventory.
Appendix B

Aircraft in Scheduled Depot Maintenance by Contract Year

(Approved) According to the 116th Air Control Wing user, to ensure its required number of aircraft were available for training and missions, no more than \[\text{aircraft could be in scheduled depot maintenance at any given time.}\] However, as shown in the figure, during several months, more than \[\text{aircraft were in scheduled depot maintenance from TSSR contract option periods 11.5 to 15.}\]

Note: The source material stated TSSR 11 when it was actually TSSR contract option period 11.5. Source: 116th Air Control Wing.
Appendix C

Unallowable Award Fees Paid in Contract Option Periods 14 and 15

The JSTARS contracting officer made unallowable award fee payments totaling $7.6 million in TSSR contract option periods 14 and 15. The payments exceeded the maximum percentage of award fee allowed by the FAR\textsuperscript{27} and Air Force Award Fee guidance.\textsuperscript{28} The table shows the unallowable award fees paid in contract option periods 14 and 15.

<table>
<thead>
<tr>
<th>TSSR Period</th>
<th>Allowable Amount</th>
<th>Amount Paid</th>
<th>Unallowable Payments</th>
<th>Allowable Amount</th>
<th>Amount Paid</th>
<th>Unallowable Payments</th>
<th>Total Unallowable Amount</th>
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</thead>
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<td>$6,815,554</td>
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<td>$7,571,559</td>
</tr>
</tbody>
</table>

Note: Totals may not equal the actual sum due to rounding.
Source: DoD OIG.

\textsuperscript{27} FAR 16.401(e)(3)(iv).
\textsuperscript{28} Department of the Air Force Award Fee Guide, August 13, 2010, Section 3.1.4, “Additional Considerations.”
Department of the Air Force Comments

DEPARTMENT OF THE AIR FORCE
AIR FORCE LIFE CYCLE MANAGEMENT CENTER
HANSCOM AIR FORCE BASE MASSACHUSETTS

MEMORANDUM FOR HQ AF/EPMP/AQ/AG
PENTAGON
WASHINGTON DC 20330-1130

FROM: AFPEO/IBM
3 Eglin Street, Bldg 1624
Hanscom AFB MA 01731-2115


1. AFPEO/IBM concurs with the results and findings stipulated in the subject ROA. Management comments and corrective actions are provided in the attachment.

2. Direct questions to AFLCMC/HBGC, DSN 000 for the Battle Management (HB) Directorate, AFLCMC/HBF, Com.

STEVEN D. WERT, SES, DAF
Program Executive Officer for Battle Management
MEMORANDUM FOR: AFPRO BATTLE MANAGEMENT
5 EGLINT ST
HANICO M AFB MA 01731-1200
HQ AFPRPK/AQAG
PENTAGON
WASHINGTON DC 20339-1430
INT TURN
FROM: AFLCMC/HRGC
235 Bynum St Suite 10A
Robins AFB GA 31098-1670


1. Management comments are submitted in collaboration with the Senior Center Contracting Official at Robins AFB, GA (AFSC/PK).

2. We concur with the results and findings stipulated in subject ROA. Management comments and corrective actions appear in attachment.

3. Report clarification: the draft ROA directs AFSC/PK to implement recommendation 1 and the AFPRO Battle Management (BM) at Hanscom AFB, MA, to implement recommendations 2 and 3. It is important to note that with the approval of AFPRO BM, all corrective actions will be implemented and certified by the CSRS Division Chief (HRGC) at Robins AFB, GA.

4. Language for recommendation 2b was reworded with DoD-IG. Our response, consistent with the new language appears in Attachment 3, Management Comments.

5. Direct questions to AFLCMC/HRGC; DSN 684-2222; COM 421-2002; or the Battle Management (BM) Directorate AFSC/PK, AFLCMC/HRGC; DSN 684-2000; COM 421-7415.

RAYMOND C. WIER III Col, USAF
Senior Materiel Leader
CSRS Division

Attachment:
1. Management Comments (4 pages)

ccc:
HMG Division File Clerk
Battle Management Audit Focal Point (BM)
Management Comments

Department of the Air Force Comments (cont’d)

MANAGEMENT COMMENTS

1. Recommendation 1: (U) We (DoD/IG) recommend that the Director, contracting office, National Air and Space Intelligence Center, require the [HKB] contracting office to:

   a. (U) Review the Total System Support Responsibility (TSSR) contract clause to establish a procedure for the contracting officer to verify the appropriateness of all contractor-proposed work under the contract, before performance of the work is required by the Defense Federal Acquisition Regulation Supplement (DFARS) 212.417-7026.

   1. (U) Concur with recommendation 1a.

2. OPEN.


   a. (U) Background/History: The main purpose of the TSSR was for the contractor to assumeolk-level responsibility for the Joint Surveillance Target Attack Radar System (JSTARS) weapon system under the terms and conditions of the contract. The contractor would be directly responsible for the day to day management, direction, and control of program activities and resources. DFARS 212.417-7026, Over and Above was not used in the contract when awarded; however, a special clause “H-953 Depot Maintenance Unanticipated Repair Work” was developed to address required repair work found during programmed depot maintenance. All required policy and legal reviews were conducted, with the contract dollar value were conducted and the contract was approved with the H-953 clause. H-953 defines the procedures to be followed and contains negotiated rates and factors for repairs that are conducted.

   b. (U) HDKKA will work with the Defense Contract Management Agency (DCMA) to refine the review process for the anticipated repairs that are requested by Northrop Grumman (NVG) for TSSR year 7. The TSSR program office is requesting more DCMA insight of the anticipated repairs proposed by NVG and the H-953 clause will be revised accordingly. DCMA will be requested to review the appropriateness of the requested work, proposed hours, and bill of material.

   c. (U) Establishevaluation criteria in the award fee plan for Total System Support Responsibility contracts, option period 7 that adequately motivate Northrop Grumman to reduce cost and that discourage inefficiencies, in accordance with Federal Acquisition Regulation 16.401(a)(2)(i).

   1. (U) Concur with recommendation 1b.

2. OPEN.

Department of the Air Force Comments (cont’d)

FOR OFFICIAL USE ONLY

DoD-IG

Report Of Audit (ROA)

C2ISR Division (AFLCMC/IIBG)

The air Force Needs to Improve Cost-Effectiveness and Availability of the Joint Surveillance Target Attack Radar System (JSTARS), Project D2/16-001/D11-2013.300

4a. (U) Background/History: The Award Fee Plan is not developed nor is the fee determined by the Contracting Officer, although the Contracting Officer does serve as a member of the negotiating team and the Award Fee Review Board. The Award Fee Plan is approved by the Fee Determining Official (FDI) and all subsequent fee decisions are ultimately made by the FDI, with the support of the Award Fee Review Board. The Award Fee Plan is evaluated periodically to determine if a revision is necessary to accomplish program goals.

4b. (U) IBIG will make changes to the TSSR year 17 Award Fee Plan, which will be significantly revised, to include cost metric revisions. The Award Fee Plan will be part of the TSSR Year 17 negotiations in October 2016.

c. (U) (ROA) Determine if the unallowable award fees paid during Total System Support Responsibility contract option periods 14 and 15, totaling $7.6 million, can be recovered through either the “Procedures for Dispute Resolution by Alternate Dispute Resolution Process” clause in the Total System Support Responsibility contract or voluntary refund in accordance with Defense Federal Regulation Supplement, Procedure, Guidance, and Information 242.71.

1. (U) Concur with recommendation 1c.

2. (U) OPEN.


4a. (U) Background/History: During 2014 and 2015 the program office was attempting to incentivize the contractor to produce the aircraft through the PMO facility at a lower rate and reduce cost. The Fee Determining Official (FDI) decision allowed more than 100% of award fee based on the terms of the Award Fee Plan in effect during the 2014 and 2015 periods to arrive at the earned award fee and FDI approved the determination.

4b. (U) (DODC) IBIG will consult with legal counsel to determine if the request for recovery of the $7.6 million is appropriate and can be handled under the Disputes Clause of the Contract or through the procedures defined under the DFARS PCH 242.7100.


1. (U) Concur with recommendation 1d.

2. OPEN.


20 September 2016
Department of the Air Force Comments (cont’d)

Final Report Reference

2. Recommendations 2: (U) We [DoD-IG] recommend that the Program Executive Officer for Battle Management [APL/CMC/MMJ];

2a. (C) Develop a requirement to determine the need for Government engineers to be located full-time at the Lake Charles Maintenance and Modification Center to provide technical support to the JSTARS contracting officer in determining whether contractor-proposed over and above work is appropriate.

1. (U) Concur with intent recommendation 2a.

2. CLOSING.

3. (U) Actual Completion Date (ACD): 01 Dec 2015.

4a. Background/History: The JSTARS contract put the Contractor in near total System control of the airframe (to include appropriate over and above work) with minimal Government oversight. As such, the program office was not staffed to provide on-site depot technical support.

4b. (U/FOUO) HBG has requested additional manpower (OCMA and program office) to provide on-site depot technical support. In the interim, the program office has increased Government presence daily with to the depot, as well as added in-depth reviews of aircraft undergoing depot maintenance. Travel for the program office to support the increased presence at the depot began in December 2015. Engineering has specifically supported major milestone events such as the R-8 Correlation Survey, Flight Symposium and Aircraft Code Reviews.

b. (U/FOUO) Language from Recommendation 2b as it appears in DoD-IG draft ROA dated 24 Aug 2016 is struck and replaced as follows per 17 Sept 2016 agreement between APL/CMC/MMJ, AIAA/AS-8, AOG and SAIC/EM, and DoD-IG. The new language will appear in the “final” ROA to be issued by DoD-IG. Subparagraphs 2b(1), (2), (3), and (4) are 20 September 2016

Page 3 of 4
Management Comments

Department of the Air Force Comments (cont’d)

DOD 2017-003

Report Of Audit (ROA)

C2ISR Division (AFLLCMOTRC)

The Air Force Needs to Improve Cost-Effectiveness and Availability of the Joint Surveillance Target Attack Radar System (JSTARS), Project D25013-0001-01625-000

In reply to the new language: “Direct the program manager for the Joint Surveillance Target Attack Radar System to perform a service life study to determine if there are cost-effective options to sustain the aging fleet of E-8C aircraft to allocate potential operational mission gaps until the Next Gen JSTARS Recapitalization Program achieves full production.”

1. (L) Concur with recommendation 2b.

2. OPEN.

3. (L) Estimated Completion Date (ECD): 01 May 2017.

4a. (H) Background/History: The fuselage is one of the primary service life limiting structures on the E-8C. Widespread Fatigue Damage (WFD) in the fuselage structure is the concern due to the age of the E-8C aircraft. HHG asked Boeing to perform the WFD analysis on seven sections of the fuselage in February 2016. The study is scheduled to be completed by March 2017.

4b. (L) After the Air Force receives the data from the Boeing study, HHG will use the data to determine the requirements to extend the E-8C service life. This will include funding requirements and schedule associated with potential service life extension activities required to keep the fleet operational.

3. Recommendation 3: (L) We [DOD-2017] recommend that the Program Executive Officer for Battle Management (AFSAC/MLC) direct the Joint Surveillance Target Attack Radar System (JSTARS) program manager (HHG), with support from the Joint Surveillance Target Attack Radar System (JSTARS) Contracting Officer (HHKAA), to reduce the sustainment life requirement on the follow-on contract for Total System Support Responsibility contract option period 17 linking the aircraft availability metric requirement to the air control wing’s desired outcome for aircraft availability in accordance with the Performance Based Logistics Guidelines.

a. (L) Concur with recommendation 3.

b. OPEN.


d. HHG has recommended changing TSSR Year 17 aircraft availability award fee criteria from a Deviation in Total Aircraft Processed Days (TAPD) to a Work in Progress (WIP) metric. This change in evaluation criteria will directly the NGC’s award fee to the user’s requirement of a target WIP of three aircraft in depot. This factor will also carry a 75% weight, the highest within the Award Fee Evaluation. The TSSR 17 Award Fee criteria will be implemented by 31 October 2016.

26 September 2016
MEMORANDUM FOR [HQ AF/PM/PAA/FAG]

FROM: AFLCMC/CHIEF
5 Egleston St., Bldg. 1424
Hanscom AFB, MA 01731-2415


References: (a) Email by [email], OIG DoD, 13 Sep 2016 (1512 hours), regarding Rec. 2b.
(b) Email and AFLCMC/CHIEF response, 20 Sep 2016, same subject.

1. (U) At the request of [email], OIG DoD, in referenced email, the following is submitted as administrative clarification and rationale for negotiating a change to the language of Recommendation 2b as it appeared in original draft ROA released 24 August 2016.

2. (U) This administrative action is submitted in collaboration with [email], HAVAR, and by permission of [email], Chief, CZISR Division (C) [email], Robins AFB, GA.

3. (U) Paragraph 2(b)(4)(c) is ADDED to AFLCMC/IBG management comments (20 Sep 2016):

   4c. (U) The original language to Recommendation 2b was re-negotiated with DoD IG for the following reasons: re-doing the current PRR onto an alternate airframe would require extensive re-engineering, modification, and testing so that new airframe which would likely take as much time as the JSTARS EMD phase because aircraft vendors or system integrators would be starting cold. Furthermore, the process to secure funding for such an effort would consume a considerable portion of the timeline between now and the RPRPC FY16. Funding the development and procurement of such an alternative would directly drain resources needed for the RPRPC program, extending or completely compromising that effort.

4. (U) Direct questions to [email] in the Battle Management (IBG) Directorate AFB, [email].

   [Signature]

   Scott J. Chapman
   Chief, CZISR Division (C) [email]
   [Name]

   cc: [Emails]
MEMORANDUM FOR: Office of Inspector General, Department of Defense

SUBJECT: DoD IG Draft Report of Audit: JSTARS Project D2015-000AH-0263.000

(1) I have reviewed the proposed response to subject report that is contained in the HBG memo dated 20 Sep 2016. I concur with the response as it relates to Recommendation 1 of subject report.

(2) If you have any questions please contact the POC at com: ******

[Signature]
ANTHONY J. BAUMANN, SES
Director of Contracting
Senior Center Contracting Official
## Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tr>
<td>AFLCMC</td>
<td>Air Force Life Cycle Management Center</td>
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<tr>
<td>C2ISR</td>
<td>Command and Control, Intelligence, Surveillance and Reconnaissance</td>
</tr>
<tr>
<td>DAPD</td>
<td>Deviation in Total Aircraft Possessed Days</td>
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<td>DCMA</td>
<td>Defense Contract Management Agency</td>
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<tr>
<td>EAC</td>
<td>Estimate at Completion</td>
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<tr>
<td>FAR</td>
<td>Federal Acquisition Regulation</td>
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<td>JSTARS</td>
<td>Joint Surveillance Target Attack Radar System</td>
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<td>LCMMC</td>
<td>Lake Charles Maintenance and Modification Center</td>
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<td>Total System Support Responsibility</td>
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