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Accessible Version

November 19, 2015

The Honorable Ashton Carter

The Secretary of Defense

Bulk Fuel Pricing: DOD Needs to Take Additional Actions to Establish a More Reliable Methodology

Dear Secretary Carter:

Each fiscal year, the Office of the Under Secretary of Defense (Comptroller), in coordination with the Defense Logistics Agency, sets a standard price per barrel that the Department of Defense (DOD) will charge for fuel, which the military services and other fuel customers use in developing their annual budget requests. In setting this standard price, DOD endeavors to closely approximate the actual price it will pay for the fuel during the year of budget execution. However, due to the timing of DOD's budget process, the department establishes the standard price almost a year in advance of when it begins to actually purchase the fuel at the current market rate.¹ Historically, DOD has used economic assumptions data provided by the Office of Management and Budget (OMB) to establish the standard price.

In July 2015, we notified you that, in response to a provision in the Senate committee report accompanying its version of the National Defense Authorization Act for Fiscal Year 2016, we would be reviewing DOD's and the military services' approaches to estimating fuel consumption and related costs in annual budget requests.² Based on information we collected as part of that ongoing review, we understand that the department is currently considering methodologies for setting the standard fuel price for fiscal year 2017. Because an official with the Office of the Under Secretary of Defense (Comptroller) who oversees DOD's bulk fuel program told us that the department expects to finalize its methodology and determine the standard price by December 2015 for inclusion in the department's fiscal year 2017 budget request, we are sending this report to share timely observations based on our ongoing review, specifically regarding the extent to which DOD adjusted its methodology for determining the standard price used in developing the fiscal year 2016 budget request. Meanwhile, we are continuing our review of DOD's fuel consumption estimates and will include the issues raised in this report and any actions you take to resolve them, along with any additional findings, in our final report that we expect to complete in early 2016.

To evaluate the extent to which DOD adjusted its methodology for determining the standard price used in developing the fiscal year 2016 budget request, we reviewed documentation on DOD's analysis of various methodologies it examined, as well as its justification for the one it

¹DOD has the option of raising or lowering the standard price during the budget year of execution to account for actual prices for fuel on the world market. According to DOD officials, this is not their preferred approach.

²S. Rep. No. 114-176, at 116-49 (2015), which accompanied S. 1376, a proposed bill for the National Defense Authorization Act for Fiscal Year 2016.

ultimately chose to apply for fiscal year 2016. We did not evaluate the relative costs or benefits of the methodologies that DOD considered—such as the limitations or uncertainties that may be inherent in selecting one methodology over another. Specifically, we determined how DOD applied OMB's *Gas and Oil* price index³ when evaluating methodologies for setting the standard fuel price for fiscal year 2016. We calculated three scenarios of price estimates for the refined fuel portion of the standard price applying the *Gas and Oil* price index and actual refined fuel prices for fiscal years 2010 through 2016. We then calculated the differences between the prices for refined fuel under the three scenarios and the price DOD used in its analysis for these same fiscal years. To determine the reliability of the fuel price data provided to us by DOD, we obtained information on how the data were used through interviews with an official in the Office of the Under Secretary of Defense (Comptroller) who oversees DOD's bulk fuel program. To corroborate these data, we compared the actual fuel price data DOD used in its analysis against fuel price data we previously reported on⁴ and determined that the data presented in our findings are sufficiently reliable for the purposes of this report. We also compared DOD's methodology for establishing the fiscal year 2016 standard price for budgeting purposes with OMB's A-11 Circular⁵ that governs federal agencies' budget development and with GAO's *Cost Estimating and Assessment Guide*,⁶ which outlines a compilation of best practices, including the characteristics of a credible cost estimate, that federal cost-estimating organizations and industry use to develop and maintain reliable cost estimates. We also interviewed officials from the Office of the Under Secretary of Defense (Comptroller) and OMB about DOD's methodology for developing its standard price in fiscal year 2016, as well as plans for determining the methodology in the future.

We conducted this performance audit from July 2015 to November 2015 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.

Results in Brief

DOD adjusted its methodology for developing the standard fuel price for the fiscal year 2016 budget request in order to develop a more precise estimate, but the new methodology does not reflect actual market conditions or fully account for risks to the reliability of its fuel cost estimate. In July 2014, we found that DOD had not updated its approach to establish the standard price for fuel to reflect existing market conditions since 2007 and recommended that DOD reevaluate its approach for estimating its fuel price and document assumptions, including providing a

³A price index is a normalized average that shows the change in the price over time from a reference year, which is defined as 100.0. An increase of 22 percent from that reference year, for example, is shown as 122.0. According to an OMB official, the *Gas and Oil* price index is based on the Commerce Department's Bureau of Economic Analysis's *Motor Vehicle Fuel, Lubricants, and Fluids* price index. The *Motor Vehicle Fuel, Lubricants, and Fluids* index, part of the Personal Consumption Expenditure component of the Consumer Price Index, reflects the regular domestic household use of motor fuel. According to the official, OMB adjusts the *Gas and Oil* price index for federal agencies' use in developing budgets estimates to account for a future projected price of crude oil.

⁴GAO, *Bulk Fuel Pricing: DOD Needs to Reevaluate Its Approach to Better Manage the Effect of Market Fluctuations*, [GAO-14-595](#) (Washington, D.C.: July 8, 2014).

⁵Office of Management and Budget, *Preparation, Submission, and Execution of the Budget*, Circular No. A-11 (2015).

⁶GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, [GAO-09-3SP](#) (Washington, D.C.: March 2009).

detailed rationale for how it estimates each of the components of the standard price. DOD generally agreed with our recommendations and, in December 2014, implemented a new methodology to establish the fiscal year 2016 standard fuel price. This new methodology used OMB's *Gas and Oil* price index to develop the fiscal year 2016 budget estimate instead of its prior approach, which was based on a projection of the price of crude oil and on factors such as refining costs. DOD noted in a memorandum approving the change that the new methodology would provide a closer price estimate to actual fuel prices than its previous methodology, among other benefits. However, DOD did not use valid and reliable data on market conditions when evaluating options for adjusting its fuel pricing methodology, unlike what is suggested by GAO's Cost Estimating and Assessment Guide.⁷ Specifically, DOD used the *Gas and Oil* price index as a dollar value rather than applying it in its analyses as a percentage to measure the change in prices from one year to the next. When we discussed this with an official with the Office of the Under Secretary of Defense (Comptroller) who oversees DOD's bulk fuel program, the official explained that they erroneously applied the price index in the methodology used to determine the standard price included in the fiscal year 2016 budget request that was submitted to Congress in February 2015. We found that applying the *Gas and Oil* price index as a percentage to measure the change in actual refined fuel prices from one year to the next produced results that differed from what DOD found in its analysis. For example, in its analysis, DOD used the *Gas and Oil* price index for fiscal year 2016 as a dollar price of \$122.56 per barrel of refined fuel. In contrast, we calculated a refined fuel price estimate for fiscal year 2016 between \$58.10 and \$83.58, depending on how the *Gas and Oil* price index is applied to actual refined fuel prices. By not using valid and reliable data, DOD increased the risk that its standard price for fiscal year 2016 did not reflect actual market conditions. Furthermore, in its analysis of the pricing methodology based on the use of the price index, DOD did not review and understand the limitations and risks to the reliability of its fuel estimates. These limitations and risks result from determining a projected fuel price that applies the price index against actual fuel prices for prior fiscal years that would be almost 2 years old at the time of its budget request. GAO's Cost Estimating and Assessment Guide states that data should be fully reviewed to understand the limitations and risks before being used in a cost estimate. By not fully reviewing and understanding the limitations of the data, DOD was not well positioned to determine the extent of the risk of using the methodology it used in determining the standard price for fiscal year 2016 when compared to other methodologies.

DOD Adjusted Its Standard Price Methodology and Pricing for the Fiscal Year 2016 President's Budget

DOD implemented a new methodology in fiscal year 2016 to address our findings and recommendations regarding its approach for establishing the standard fuel price. Specifically, in July 2014 we found that DOD had not updated its approach to establishing the standard price for fuel to reflect existing market conditions since 2007.⁸ For prior fiscal years, including fiscal year 2015, DOD set the standard price based on a projected price of crude oil and other factors such as refining costs and other various operating costs. During fiscal years 2009 through 2013, however, we found DOD's actual costs for bulk fuel differed considerably from its budget estimates, due largely to fluctuations in fuel price. Our analysis showed that during those years, DOD either under- or overestimated what it would have to pay for bulk fuel. For example, in

⁷GAO's Cost Estimating and Assessment Guide states that one characteristic of a credible cost estimate is the availability of valid data that are suitable and relevant.

⁸[GAO-14-595](#).

2009, DOD overestimated the price it would pay for fuel by about \$3 billion and underestimated costs in 2012 by about \$3.2 billion. Our analysis also showed that the differences between the price DOD paid for fuel and its standard price for these years accounted for, on average, 74 percent of the difference between its estimated and actual costs.

We, therefore, recommended that DOD reevaluate its approach for estimating the standard price so that the department would be better positioned to develop more informed estimates that minimized risks and uncertainty resulting from changing market conditions. We also recommended that DOD document its assumptions, including providing detailed rationale for how it estimates each component of the standard price. DOD agreed with our first recommendation, stating that the department continually evaluates methods to better estimate the price of fuel. In its comments, DOD noted that the rate-setting process takes place a budget cycle in advance of budget execution and that this presents a challenge. DOD partially agreed with our second recommendation, and in its comments noted that the department does not have a documented, specific, step-by-step process to develop the standard price. However, DOD stated that it prices fuel by using a formal process that has been presented to the department's leadership, briefed to congressional staffers, discussed with the administration, and reproduced in various instructional and informational briefings and papers. We noted that GAO's Cost Estimating and Assessment Guide states that a cost estimate should be supported by detailed documentation that describes how it was derived. According to the guide, the documentation should include, among other things, the estimating methodology used to derive the costs for each element of the cost estimate, and it should also discuss any limitations of the data or assumptions. We therefore maintained that documenting DOD's assumptions would provide greater transparency and clarify for fuel customers and decision makers the process DOD uses to set the standard price.

Consistent with our 2014 recommendation, DOD evaluated three methodologies to establish its standard price for its fiscal year 2016 budget request. According to DOD's analysis, it evaluated these methodologies using economic assumptions data provided by OMB.⁹ Specifically, DOD considered two options for establishing the standard price based on projected crude oil prices—using two different crude oil benchmarks¹⁰—and a third option that applied the *Gas and Oil* price index. DOD chose the option using the *Gas and Oil* price index and implemented this new methodology in December 2014, using it to develop the fiscal year 2016 budget estimate. In a memorandum from the Office of the Under Secretary of Defense (Comptroller) approving the change, DOD noted that it would use the process it used in prior years for out-year projections. The memo also said that the new methodology would provide a price estimate closer to actual fuel prices than its previous methodology, and by continuing to use its prior methodology for out-year projections, an additional fuel price benchmark along with the use of the price of crude oil, as well as another year to gather more data on the use of the price index.

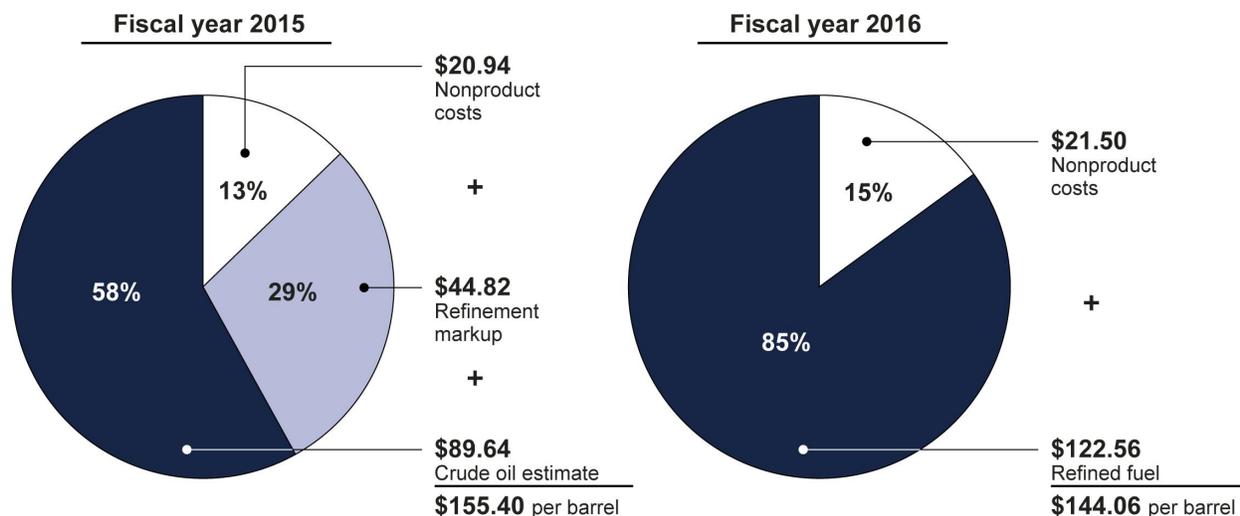
Figure 1 shows a comparison of how DOD calculated the fiscal year 2015 standard price with the approach it used in prior years, and how it calculated the fiscal year 2016 standard price

⁹OMB's Circular No. A-11, *Preparation, Submission, and Execution of the Budget*, requires that federal agencies' budget submissions be consistent with OMB's economic assumptions. In our prior work, we reported that DOD has discretion over which economic assumptions provided by OMB to apply in developing its bulk fuel estimates for budgeting purposes.

¹⁰Specifically, DOD's analysis included the West Texas Intermediate and Brent crude oil benchmarks. West Texas Intermediate is a crude oil produced in Texas and southern Oklahoma that serves as a reference or "marker" for pricing a number of other crudes and is traded in the domestic spot market at Cushing, Oklahoma. Brent is a blended crude oil produced in the North Sea region that serves as a reference or "marker" for pricing a number of other crudes.

using its new methodology. For fiscal year 2016, DOD established the projected price of refined fuel at \$122.56 per barrel.

Figure 1: Comparison of the Components of DOD’s Fiscal Year 2015 and Fiscal Year 2016 Standard Price



Source: GAO analysis of Department of Defense (DOD) data. | GAO-16-78R

Notes: Percentages may not add to 100 percent due to rounding. According to DOD officials, in fiscal year 2015 and prior years the refinement markup was determined based on a percentage of the forecasted crude oil price. This markup has historically ranged from 30 percent to 50 percent of the price of crude oil. Nonproduct costs include facilities sustainment, restoration, and modernization; transportation; and storage costs.

Data table for Figure 1: Comparison of the Components of DOD’s Fiscal Year 2015 and Fiscal Year 2016 Standard Price

Fiscal Year	Components	Percentage
2015	Nonproduct costs	13%
	Refinement markup	29%
	Crude oil estimate	58%
2016	Nonproduct costs	15%
	Refined fuel	85%

DOD Did Not Use Valid and Reliable Data in Its Evaluation of Pricing Options

DOD did not use valid and reliable data on market conditions when evaluating options for adjusting its fuel pricing methodology because it used the *Gas and Oil* price index value as a dollar value rather than applying it in its analyses as a percentage to measure the change in prices from one year to the next. In evaluating methodologies to establish the standard price for fiscal year 2016, DOD concluded in its analysis that the use of one crude oil benchmark over another did not provide a greater level of pricing stability. It further concluded that the 3-year average for the *Gas and Oil* price index was closer to the actual fuel price paid than the crude oil benchmark it previously used. Specifically, it found that the *Gas and Oil* index more closely approximated actual fuel prices than the department’s budget estimate for fiscal years 2012 through 2014. As a result, for its fiscal year 2016 estimate, DOD set the initial standard price for refined fuel equal to the value of the *Gas and Oil* price index in the economic assumptions that

OMB provided to federal agencies in November 2014 to develop their fiscal year 2016 budget estimates.

GAO's Cost Estimating and Assessment Guide states that one characteristic of a credible cost estimate is the availability of valid data that are suitable and relevant.¹¹ However, in evaluating methodologies to set the standard price for fiscal year 2016, DOD did not use valid and reliable data because it used the *Gas and Oil* price index value as a dollar value rather than applying it as a percentage to measure the change in prices over time. An OMB official confirmed to us that the *Gas and Oil* price index should not be used as a dollar value. When we discussed this with the official from the Office of the Under Secretary of Defense (Comptroller) who oversees DOD's bulk fuel program, the official explained that they erroneously applied the price index. DOD's fiscal year 2016 budget request had been submitted to Congress by the time officials learned of the erroneous application of the price index in March 2015. According to the official, the department is reviewing its methodology for developing the fiscal year 2017 standard fuel price and is considering options, including using the *Gas and Oil* price index.

Our analysis found that applying the *Gas and Oil* price index as a measure of the change in prices over time, and not as a dollar value, produced results that differed from what DOD produced in its analysis. To perform our analysis, we applied the value of the *Gas and Oil* price index to actual refined fuel prices paid by DOD. To do so, we first determined the percentage change in the *Gas and Oil* price index from one fiscal year to the next for fiscal years 2009 through 2016. We then determined a range of price estimates for the refined fuel portion of the standard price¹² for fiscal years 2010 through 2016 using the annual percentage change from the *Gas and Oil* price index and actual refined fuel costs paid by DOD under three scenarios: (1) the average price paid by DOD for refined fuel in the previous fiscal year; (2) the price paid by DOD for refined fuel in September of the previous fiscal year; and (3) the average price paid by DOD for refined fuel for a 6-month period (April through September) of the previous fiscal year. See Enclosure I for more details on our calculations for the three scenarios of price estimates for refined fuel applying the *Gas and Oil* price index.

Table 1 shows the results of DOD using the *Gas and Oil* price index as a dollar value and our application of the *Gas and Oil* price index as an average change in prices over time in our three scenarios rather than as a dollar value. For example, DOD's application of the price index as a dollar value for fiscal year 2016 produced an estimate for the refined fuel portion of the standard price of \$122.56. However, the three scenarios we calculated produced a price estimate between \$58.10 and \$83.58.

¹¹[GAO-09-3SP](#).

¹²DOD historically developed the standard price based on the price of crude oil provided by OMB and on other factors such as refining costs and various operating costs. Our calculation represents the portion of the standard price that reflects the price of refined fuel and does not include operating costs.

Table 1: Comparison of Gas and Oil Price Index Used as a Dollar Value and Applied as a Change in Prices over Time

Dollars per barrel of refined fuel, excluding nonproduct costs

Fiscal year	Price index used as a dollar value by DOD	Scenario 1: price index applied by GAO to average actual costs for previous fiscal year	Scenario 2: index applied by GAO to actual price paid in September of previous fiscal year	Scenario 3: index applied by GAO to average actual price paid in April through September of previous fiscal year
2009	100.00 ^a	N/A	N/A	N/A
2010	154.78	124.23	132.03	123.07
2011	132.89	87.38	90.93	89.28
2012	138.88	145.67	154.05	157.31
2013	155.88	171.14	183.22	174.17
2014	155.83	150.96	154.88	147.44
2015	134.74	121.21	115.89	120.59
2016	122.56	83.58 ^b	58.10 ^b	75.62 ^b

Source: GAO analysis of Department of Defense (DOD) and Office of Management and Budget (OMB) data.

Note: We did not calculate estimates for fiscal year 2009 because we did not gather fiscal year 2008 actual price paid data, which would be needed in order to apply the percentage change in the *Gas and Oil* price index.

^aAccording to a DOD official, fiscal year 2009 was the base year for the fiscal year 2016 *Gas and Oil* price index value it used in its analysis.

^bOur calculations for the fiscal year 2016 price estimates are based on data on actual refined fuel prices as of August 31, 2015.

By not using valid and reliable data, DOD ran the risk that the data it used would not reflect actual market conditions. Differences between actual and estimated fuel prices can significantly affect DOD and its fuel customers in the year of budget execution. For example, during fiscal years 2009 through 2013, the military services purchased an average of approximately 110 million barrels per year from DOD. Therefore, a standard price increase of even \$1 per barrel would result in a \$110 million difference from the services' budget requests.

DOD Did Not Fully Review or Understand Limitations and Risks to the Reliability of Its Fuel Cost Estimates

DOD faces inherent risks and limitations regardless of any methodology it applies to develop its standard price for fuel, notably that it must forecast a fuel price 18 months in advance of budget execution. These risks and limitations, when combined with the volatility of world fuel prices, have at times resulted in large differences between actual and estimated fuel costs and in instances of considerable under- and overstatement of fuel costs. In its methodology for estimating the standard price for fiscal year 2015 and prior years, certain risks and limitations affected the reliability of DOD's fuel estimates. For example, we reported in 2014 that in developing the standard price, DOD did not consider such risks and limitations as (1) differences between crude oil benchmarks;¹³ (2) differences between domestic and international crude oil prices; and (3) the decreasing relationship between the prices of crude oil and refined fuel.¹⁴

For these years, DOD's calculation of its standard price did not involve the application of actual fuel costs in its projection. In contrast, to apply the price index as a reflection of the change in prices over time, DOD would have needed to have applied the price index to actual refined fuel cost data. GAO's Cost Estimating and Assessment Guide states that data should be fully reviewed before being used in a cost estimate to understand the limitations and risks. However,

¹³For example, we reported that, from fiscal years 2010 through 2013, the price for West Texas Intermediate crude oil diverged from other crude oil pricing benchmarks, such as Brent. However, we noted that DOD had not adjusted its use of crude oil benchmarks for estimating energy prices as a result of this price difference.

¹⁴[GAO-14-595](#).

in applying the *Gas and Oil* price index as a dollar value rather than a reflection of a change in prices over time, DOD did not review or understand the risks to the reliability of its fuel estimates that results from applying the price index against actual fuel prices from prior fiscal years to determine a projected fuel price.

Further, given the timing of DOD's budget development, DOD would be limited in applying the *Gas and Oil* price index for a subsequent fiscal year because complete data on actual fuel costs for the current fiscal year are unavailable when DOD develops its budget request. As a result, it would be limited to applying the *Gas and Oil* price index against actual fuel prices that were almost 2 years old at the time of its budget request to project its refined fuel portion of the standard price. For instance, had DOD applied the *Gas and Oil* price index as a reflection in the change in price over time in its fiscal year 2016 budget request, it would not have actual refined fuel cost data for fiscal year 2015 and so would instead perform its analysis on actual fuel cost data for fiscal year 2014, which would be almost 24 months old by the end of fiscal year 2016. We were able to calculate price estimates for the refined fuel portion of the standard price using the *Gas and Oil* price index for fiscal years 2010 through 2016 because, at the time of our analysis, data were available on actual refined fuel costs for prior fiscal years, that is, 2009 through 2015.¹⁵

This limitation of applying the *Gas and Oil* price index against actual fuel prices that are almost 2 years old at the time of its budget request can affect the reliability of DOD's fuel cost estimates. Our analysis found that applying the *Gas and Oil* price index as a measure of the change in prices from one year to the next to determine the refined fuel portion of the standard price for fiscal year 2016, using available data on actual refined fuel prices for fiscal year 2014, produces a refined fuel price estimate between \$105.91 and \$110.21 per barrel, depending on how the price index is applied to actual refined fuel prices. For its fiscal year 2016 request, DOD used the *Gas and Oil* price index as a dollar value of \$122.56 per barrel of refined fuel. According to its budget materials, DOD has a fiscal year 2016 estimate of planned fuel consumption totaling 81 million barrels of fuel, which, according to our analysis, led DOD to request in its fiscal year 2016 budget request \$9.9 billion for the refined fuel portion of its standard price.¹⁶ In contrast, the difference between the estimates for refined fuel when applying the price index as a reflection of the change in prices from fiscal year 2014 would have resulted in a budget request for the refined fuel portion of the standard price between about \$8.6 billion and about \$8.9 billion, depending on how the price index was applied to fiscal year 2014 actual refined fuel prices. Because it used the *Gas and Oil* price index as a dollar value in developing the fiscal year 2016 budget request and not as a reflection of a change in prices over actual refined fuel costs, DOD did not fully review or understand the risk that projecting a standard price based on actual fuel cost data from 2 fiscal years prior to its budget request posed to the reliability of its fuel estimate. As a result, DOD was not well positioned to determine the extent of the risk of using the methodology it used in establishing the standard price for fiscal year 2016 when compared to other methodologies.

¹⁵Our calculations for fiscal year 2016 price estimates are based on data on actual refined fuel prices as of August 31, 2015.

¹⁶DOD estimated its fiscal year 2016 nonproduct costs per barrel to be \$21.50, which it then added to its estimate of \$122.56 per barrel for refined fuel, leading to a standard price estimate of \$144.06 per barrel. With planned consumption of 81 million barrels for fiscal year 2016, our analysis found that DOD's total budget request for fuel for the fiscal year was about \$11.7 billion.

Conclusions

DOD faces unique challenges in estimating a standard price that closely approximates the price it will pay for fuel up to 2 years later. The standard price is designed to provide a stabilized price for DOD's fuel customers that can help to manage price fluctuations and can shield the military services from the volatility in the global fuel market. In our 2014 report, we recommended that DOD reevaluate its approach for estimating the standard price and document its assumptions, including providing a detailed rationale for how it estimates each of these components. For fiscal year 2016, DOD revised its methodology for developing the standard price in an attempt to address our findings and recommendations about the forecasting of its fuel costs. However, in doing so it did not use reliable and valid data in assessing potential methodologies when it erroneously used OMB's *Gas and Oil* price index as a dollar value. The use of unreliable data in establishing the standard fuel price for fiscal year 2017 or future fiscal years exposes DOD to risk that the standard price it develops will not reflect actual market conditions. Furthermore, although DOD adjusted its methodology for fiscal year 2016, it did not review or understand the limitations of the data available to it on actual fuel costs. As a result, DOD is not well positioned to determine the extent of the risk to its fuel cost estimates of using the methodology it used in establishing the standard price for fiscal year 2016 in future fiscal years. By using more valid and reliable data and reviewing and understanding the limitations of the data available to it at the time of its budget development, DOD could reduce the risk that its standard price for fiscal year 2017 and future fiscal years would not reflect market conditions and therefore contribute to an over- or understatement of its fuel costs.

Recommendations for Executive Action

To improve DOD's methodology for developing its standard fuel price for fiscal year 2017 and future fiscal years, we reiterate our recommendations from our 2014 report that DOD reevaluate its approach for estimating the standard price and document its assumptions, including providing a detailed rationale for how it estimates each component of the price.

In keeping with our 2014 recommendations, we further recommend that the Secretary of Defense direct the Office of the Under Secretary of Defense (Comptroller) to take the following two actions as it reviews the methodology for developing the standard fuel price for fiscal year 2017 and future fiscal years:

- use valid and reliable data on market conditions, and
- review and understand the risks and limitations of using data, such as actual fuel price data from 2 years prior, in the methodologies it assesses.

Agency Comments and Our Evaluation

We provided a draft of this report to DOD for review and comment. DOD provided written comments, which are summarized below and reprinted in Enclosure II. In its comments, DOD partially concurred with our first recommendation and concurred with our second recommendation.

DOD stated that it partially concurred with our first recommendation, which reiterated the recommendations from our July 2014 report, that DOD reevaluate its approach for estimating the standard price and document its assumptions, including providing detailed rationale for how it estimates each component of the price. It is not clear from DOD's comments the reasons for the partial concurrence and what actions it may or may not be taking in response to our 2014 recommendations. DOD's comments describe the process for establishing fuel prices, in which it notes that the process for setting the fuel price is similar to other Working Capital Fund

products and follows the approach documented in DOD's Financial Management Regulation and congressional implementing language for full cost recovery. However, as we found in 2014 and again for this report, DOD is not following best practices for setting the standard fuel price. According to GAO's Cost Estimating and Assessment Guide, a cost estimate should be supported by detailed documentation that describes how it was derived. The guide specifies that the documentation should include, among other things, the estimating methodology used to derive the costs for each element of the cost estimate, and it should also discuss any limitations of the data or assumptions. As we note in this report, DOD did not use valid and reliable data in its methodology for determining the standard price for fiscal year 2016 because it erroneously applied OMB's Gas and Oil price index, an error which DOD did not learn of until March 2015 after its fiscal year 2016 budget request had been submitted to Congress. Therefore, we continue to believe that DOD should reevaluate its approach for estimating the standard fuel price and document its assumptions, including the rationale for each component of the standard price, as doing so would provide greater transparency and clarify for fuel customers and decision makers the process DOD uses to set the standard price.

DOD concurred with our second recommendation that the Secretary of Defense direct the Under Secretary of Defense (Comptroller) to use valid and reliable data and review and understand the risks and limitations of using data, such as using actual fuel price data from 2 years prior, as it reviews the methodology for developing the standard fuel price for fiscal year 2017 and future fiscal years. In its comments, DOD stated that it continually evaluates methods to improve fuel price estimations, with the objective of using current open source data to produce defensible, executable stabilized prices that will optimize the use of scarce resources. However, DOD does not specify what actions it will take to address the two actions we recommended as it reviews the methodology for developing the standard fuel price for fiscal year 2017 and future fiscal years. As already reflected in our report, we do not disagree with DOD's observation that the budgeted price, established 10 months in advance of any fiscal year to meet the statutory budget submission deadline, cannot be expected to match actual market conditions in budget execution. While the timing of DOD's budget process presents challenges regardless of the methodology to develop the standard price for fuel, the department should nevertheless ensure that it uses valid and reliable data and understand the risks and limitations of using data in the methodologies it assesses, as GAO's Cost Estimating and Assessment Guide states. We found that in establishing the standard price for fiscal year 2016, DOD did not use valid and reliable data in assessing potential methodologies when it erroneously used OMB's Gas and Oil price index as a dollar value. Further, we found that DOD did not fully review or understand the limitations in the data available to it on actual fuel costs when evaluating options for establishing its standard price for fiscal year 2016. In establishing the standard price for fiscal year 2017 and future years, we continue to believe that by using more valid and reliable data and understanding the risks and limitations of the data it uses, DOD would be better positioned to ensure its standard price would reflect market conditions and minimize uncertainty that can lead to over- or understatement of its fuel costs.

We are sending copies of this report to appropriate congressional committees. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-5741 or ayersj@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 include Matt Ullengren, Assistant Director; Pedro Almoguera; and Adam Hatton.

Sincerely yours,

A handwritten signature in black ink that reads "Johana Ayers". The signature is written in a cursive style with a large, stylized initial "J".

Johana Ayers
Director, Defense Capabilities and Management
Enclosures – 2

Enclosure I: GAO's Calculation of a Standard Price Estimate Using the *Gas and Oil* Price Index

In December 2014, the Department of Defense (DOD) implemented a new methodology to establish the standard fuel price for fiscal year 2016 to address our prior findings¹⁷ about the accuracy of DOD's forecasting for bulk fuel costs. For the new methodology, DOD used the *Gas and Oil* price index¹⁸ provided in the Office of Management and Budget (OMB) economic assumptions data for the fiscal year 2016 budget estimate instead of its prior approach that was based on a crude oil price projection and other factors, such as refining costs. We determined how DOD used the *Gas and Oil* price index when evaluating methodologies for setting the fiscal year 2016 standard price for a barrel of refined fuel. Then, to apply the price index as a change in price over time in determining a range of estimates for the refined fuel portion of the standard price, we calculated three scenarios using this price index to reflect the average rate of change over time for fiscal years 2010 through 2016 and to account for a range of possible approaches to applying the price index.¹⁹

For our first scenario, determining a standard price estimate for refined fuel using the *Gas and Oil* price index, we applied the percent change in the *Gas and Oil* price index to the average actual price paid by DOD for refined fuel for the full previous fiscal year preceding DOD's budget request. For example, as shown in table 2, OMB projected the value of the price index to increase by 12 percent from fiscal year 2012 to fiscal year 2013. We applied this 12 percent increase to the actual price of \$152.80 that DOD paid in fiscal year 2012 to establish a standard price estimate for refined fuel for fiscal year 2013 (\$171.14 per barrel of refined fuel).

¹⁷GAO, *Bulk Fuel Pricing: DOD Needs to Reevaluate Its Approach to Better Manage the Effect of Market Fluctuations*, GAO-14-595 (Washington, D.C.: July 8, 2014).

¹⁸A price index is a normalized average that shows the change in the price over time from a reference year, which is defined as 100.0. An increase of 22 percent from that base period, for example, is shown as 122.0. According to an OMB official, the *Gas and Oil* price index is based on the Commerce Department's Bureau of Economic Analysis's *Motor Vehicle Fuel, Lubricants, and Fluids* price index. The *Motor Vehicle Fuel, Lubricants, and Fluids* index, part of the Personal Consumption Expenditure component of the Consumer Price Index, reflects the regular domestic household use of motor fuel. According to the official, OMB adjusts the *Gas and Oil* price index for federal agencies use in developing budgets estimates to account for a future projected price of crude oil. As discussed in this report, in establishing the standard fuel price for fiscal year 2016, DOD used the *Gas and Oil* price index value as a dollar value rather than applying it as a percentage to measure the change in prices over time.

¹⁹DOD historically developed the standard price based on the price of crude oil provided by OMB and on other factors such as refining costs and various operating costs. Our calculation represents the portion of the standard price that reflects the price of refined fuel and does not include operating costs.

Table 2: Gas and Oil Price Index Applied to Actual Fuel Costs in Previous Fiscal Year

Dollars per barrel of refined fuel, excluding nonproduct costs

Fiscal year	Price index used by DOD as a dollar value (dollars)	Average actual price paid in previous fiscal year (dollars)	Percentage change in price index from previous fiscal year (percent)	Price index applied by GAO to average actual costs for previous fiscal year (dollars)
2009	\$100.00	\$80.15	N/A	N/A
2010	154.78	101.60	55%	\$124.23
2011	132.89	138.73	-14	87.38
2012	138.88	152.80	5	145.67
2013	155.88	150.96	12	171.14
2014	155.83	140.94	0	150.96
2015	134.74	91.85	-14	121.21
2016	122.56	N/A	-9	83.58 ^a

Source: GAO analysis of Department of Defense (DOD) and Office of Management and Budget (OMB) data.

Note: We did not calculate estimates for fiscal year 2009 because we did not gather fiscal year 2008 actual price paid data, which would be needed in order to apply the percent change in the *Gas and Oil* price index.

^aOur calculations for the fiscal year 2016 price estimates are based on data on actual refined fuel prices as of August 31, 2015.

For our second scenario, we applied the percentage change in the *Gas and Oil* price index to the average actual cost paid by DOD for refined fuel in September of the prior fiscal year. This represents the last month of actual price data for the previous fiscal year. For example, as shown in table 3, OMB projected the value of the price index to increase by 5 percent from fiscal year 2011 to fiscal year 2012. We applied this 5 percent increase to the actual price paid of \$146.71 in September of fiscal year 2011 to establish a standard price estimate for refined fuel for fiscal year 2012 (\$154.05 per barrel of refined fuel).

Table 3: Gas and Oil Price Index Applied to Actual Fuel Costs in September of Previous Fiscal Year

Dollars per barrel of refined fuel, excluding nonproduct costs

Fiscal year	Price index used by DOD as a dollar value (dollars)	Average actual price paid in September of previous fiscal year (dollars) ^a	Percentage change in price index from previous fiscal year (percent)	Price index applied by GAO to actual price paid in September of previous fiscal year (dollars)
2009	\$100.00	N/A	N/A	N/A
2010	154.78	\$85.18	55%	\$132.03
2011	132.89	105.73	-14	90.93
2012	138.88	146.71	5	154.05
2013	155.88	163.59	12	183.22
2014	155.83	154.88	0	154.88
2015	134.74	134.75	-14	115.89
2016	122.56	63.85 ^a	-9	58.10 ^a

Source: GAO analysis of Department of Defense (DOD) and Office of Management and Budget (OMB) data.

Note: We did not calculate estimates for fiscal year 2009 because we did not gather fiscal year 2008 actual price paid data, which would be needed in order to apply the percentage change in the *Gas and Oil* price index.

^aOur calculations for the fiscal year 2016 price estimates are based on data on actual refined fuel prices as of August 31, 2015.

For our third scenario, we applied the percentage change in the *Gas and Oil* price index to the average actual price paid by DOD for refined fuel for April through September of the previous fiscal year. This represents a weighted average of fuel purchased over a 6-month period. For example, as shown in table 4, OMB projected the value of the price index to decrease by 14 percent from fiscal year 2010 to fiscal year 2011. We applied this 14 percent decrease to the average actual price paid of \$103.81 from April through September of fiscal year 2010 to establish a standard price estimate for refined fuel for fiscal year 2011 (\$89.28 per barrel of refined fuel).

Table 4: Gas and Oil Price Index Applied to Actual Fuel Costs in April through September of Previous Fiscal Year

Dollars per barrel of refined fuel, excluding nonproduct costs

Fiscal year	Price index used by DOD as a dollar value (dollars)	Average actual price paid in April through September of previous fiscal year (dollars)	Percentage change in price index from previous fiscal year (percent)	Price index applied by GAO to average actual price paid in April through September of previous fiscal year (dollars)
2009	\$100.00	N/A	N/A	N/A
2010	154.78	\$79.40	55%	\$123.07
2011	132.89	103.81	-14	89.28
2012	138.88	149.82	5%	157.31
2013	155.88	155.51	12%	174.17
2014	155.83	147.44	0%	147.44
2015	134.74	140.22	-14%	120.59
2016	122.56	83.10 ^a	-9%	75.62 ^a

Source: GAO analysis of Department of Defense (DOD) and Office of Management and Budget (OMB) data.

Note: We did not calculate estimates for fiscal year 2009 because we did not gather fiscal year 2008 actual price paid data, which would be needed in order to apply the percent change in the *Gas and Oil* price index.

^aOur calculations for the fiscal year 2016 price estimates are based on data on actual refined fuel prices as of August 31, 2015.

Enclosure II: Comments from the Department of Defense



COMPTROLLER

OFFICE OF THE UNDER SECRETARY OF DEFENSE
1100 DEFENSE PENTAGON
WASHINGTON, DC 20301-1100

Ms. Johana Ayers
Director, Defense Capabilities and Management
U.S. Government Accountability Office
441 G Street, NW
Washington DC 20548

NOV - 5 2015

Dear Ms. Ayers,

This is the Department of Defense (DoD) response to the GAO Draft Report GAO-16-78R, "Bulk Fuel Pricing: DoD Needs to Take Additional Actions to Establish a More Reliable Methodology," dated October 15, 2015 (GAO Code 100282).

The Department is providing official written comments for inclusion in the report.

Sincerely,

A handwritten signature in blue ink, appearing to read "John P. Roth".

John P. Roth
Deputy Comptroller

Enclosure:
As stated



**GAO DRAFT REPORT DATED NOVEMBER, 2015
GAO-16-78R (GAO CODE 100282)**

**“BULK FUEL PRICING: DOD NEEDS TO TAKE ADDITIONAL ACTIONS TO
ESTABLISH A MORE RELIABLE METHODOLOGY”**

**DEPARTMENT OF DEFENSE COMMENTS
TO THE GAO RECOMMENDATION**

RECOMMENDATION: To improve DoD’s methodology for developing its standard fuel price for fiscal year 2017 and future fiscal years, the GAO reiterates their recommendations from their 2014 report that DoD reevaluate its approach for estimating the standard price and document its assumptions, including providing detailed rationale for how it estimates each component of the price.

DoD RESPONSE: Partially Concur. The Office of the Under Secretary of Defense (Comptroller) (OUSD (C)) establishes stabilized Working Capital Fund (WCF) fuel prices by using a formal process that has been presented to the Department’s leadership, briefed to congressional staffers, discussed with the Administration, and publicized in various instructional and informational briefings and papers. The process for setting the price of fuel is closely monitored (both inside and outside the Department) and necessarily is similar to processes for establishment of stabilized rates for other WCF products and services. The pricing process documented in the Financial Management Regulation implements full cost recovery as required in section 2208(o) of Title 10, United States Code.

RECOMMENDATION: In keeping with their 2014 recommendations, the GAO further recommends that the Secretary of Defense direct the Office of the under Secretary of Defense (Comptroller) to take the following two actions as it reviews the methodology for developing the standard fuel price for fiscal year 2017 and future fiscal years:

- Use valid and reliable data on market conditions; and
- Review and understand the risks and limitation of using data, such as actual fuel price data from 2 years prior, in the methodologies it assesses.

DoD RESPONSE: Concur. The OUSD (C) and the Defense Logistics Agency continually evaluate methods to improve fuel price estimations, with the objective of using current open source data to produce defensible, executable stabilized prices that will optimize the use of scarce resources while protecting customer programs and the viability of the WCF. The budgeted price, established 10 months in advance of any fiscal year to meet the statutory budget submission deadline, cannot be expected to match actual market conditions in execution.

Text of Enclosure II: Comments from the Department of Defense

Page 1

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