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T-AO 205 John Lewis Class Fleet Replenishment Oiler (T-AO 205 Class)

As of FY 2021 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

UNCLASSIFIED

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Common Acronyms and Abbreviations for MDAP Programs

Acq O&M - Acquisition-Related Operations and Maintenance
ACAT - Acquisition Category
ADM - Acquisition Decision Memorandum
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
\$B - Billions of Dollars
BA - Budget Authority/Budget Activity
Blk - Block
BY - Base Year
CAPE - Cost Assessment and Program Evaluation
CARD - Cost Analysis Requirements Description
CDD - Capability Development Document
CLIN - Contract Line Item Number
CPD - Capability Production Document
CY - Calendar Year
DAB - Defense Acquisition Board
DAE - Defense Acquisition Executive
DAMIR - Defense Acquisition Management Information Retrieval
DoD - Department of Defense
DSN - Defense Switched Network
EMD - Engineering and Manufacturing Development
EVM - Earned Value Management
FOC - Full Operational Capability
FMS - Foreign Military Sales
FRP - Full Rate Production
FY - Fiscal Year
FYDP - Future Years Defense Program
ICE - Independent Cost Estimate
IOC - Initial Operational Capability
Inc - Increment
JROC - Joint Requirements Oversight Council
\$K - Thousands of Dollars
KPP - Key Performance Parameter
LRIP - Low Rate Initial Production
\$M - Millions of Dollars
MDA - Milestone Decision Authority
MDAP - Major Defense Acquisition Program
MILCON - Military Construction
N/A - Not Applicable
O&M - Operations and Maintenance
ORD - Operational Requirements Document
OSD - Office of the Secretary of Defense
O&S - Operating and Support
PAUC - Program Acquisition Unit Cost

PB - President's Budget
PE - Program Element
PEO - Program Executive Officer
PM - Program Manager
POE - Program Office Estimate
RDT&E - Research, Development, Test, and Evaluation
SAR - Selected Acquisition Report
SCP - Service Cost Position
TBD - To Be Determined
TY - Then Year
UCR - Unit Cost Reporting
U.S. - United States
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)
USD(A&S) - Under Secretary of Defense (Acquisition and Sustainment)

Program Information

Program Name

T-AO 205 John Lewis Class Fleet Replenishment Oiler (T-AO 205 Class)

DoD Component

Navy

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Date Assigned: March 27, 2015

References

SAR Baseline (Production Estimate)

Assistant Secretary of the Navy (Research, Development & Acquisition) (ASN(RDA)) Approved Acquisition Program Baseline (APB) dated September 15, 2017

Approved APB

Assistant Secretary of the Navy (Research, Development & Acquisition) (ASN(RDA)) Approved Acquisition Program Baseline (APB) dated February 5, 2020

Mission and Description

The JOHN LEWIS (T-AO 205) Class Fleet Replenishment Oiler program will recapitalize the T-AO 187 Class for a total of 20 ships. The United States requires military forces that can operate for long periods of time around the globe. The Navy can provide sustained military presence and operations far from the Continental United States (CONUS) with little or no reliance on host governments for basing and logistics in the immediate vicinity of operations. Such operations rely primarily on the ships of the Navy's Combat Logistics Force (CLF) for the resupply of fuel, food, ammunition, repair parts, and other consumables during underway (at-sea) replenishment events.

A critical supply item provided by the CLF, in both peace and war, is fuel to power the ships and aircraft of the Fleet. All of the Navy's CLF ships can provide fuel to Navy ships. However, the CLF's 15 T-AO 187 Class, because of their capacity and their numbers, are the backbone of the fuel delivery system. The existing CLF consists of 29 ships: two Fast Combat Support Ships (T-AOE 6 Class) built primarily to service aircraft carriers and their accompanying surface combatants; 12 Dry Cargo/Ammunition Ships (T-AKE 1 Class) built to replace the Navy's single product ammunition ships and dry cargo ships; and 15 T-AO 187 Class ships. The T-AO 187s represent about half of the number of CLF ships, but account for 75 percent of the CLF's at-sea refueling capacity.

Executive Summary

Program Highlights Since Last Report

The Lead Hull (T-AO 205) is now 65% complete and demonstrates exceptional design maturity with 95% design completion at the start of construction. T-AO 206 (Hull 2) construction began on December 13, 2019.

PB 2021 removed one ship in FY 2021 and one ship in FY 2022, which does not impact the six-ship Block Buy contract with National Steel and Shipbuilding Company (NASSCO). The sixth ship will be awarded no later than March 31, 2020. PB 2021 includes Cost to Complete for both Lead Hull (T-AO 205) and T-AO 206 cost overruns.

In July 2018, the Graving Dock incident at NASSCO forced the shift of T-AO 206 (Hull 2) through T-AO 210 (Hull 6) delivery dates between 5 and 12 months later. The Lead Hull delivery initially slipped due to late delivery of main engines, and reduction gears, and has been further exacerbated by the late delivery of pipe spools, vent, and metal outfitting material. The reschedule of yard-wide production efforts due to the Graving Dock incident also compounded delivery delays. Lead Hull delivery is now June 2021 versus the contractual delivery date of November 2020. The FY 2021 gap year reflects the production schedule impacts from the Graving Dock incident and the lead ship delay ripple impacts to T-AO 206 (Hull 2) through T-AO 210 (Hull 6) production schedules.

An APB revision was completed to update the total procurement quantity from 17 to 20 ships, reflect schedule delays, procurement profile changes (gap years FY 2021 and FY 2022), revised labor rates and overhead assumptions, material costs based on fact finding and actuals, and impact of the NASSCO Graving Dock failure on yard-wide production schedules.

There are no significant software-related issues with this program at this time.

History of Significant Developments Since Program Initiation	
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History of Significant Developments Since Program Initiation	
Date	Significant Development Description
May 2012	At the Navy Gate 2 Review, held May 2, 2012, the Navy approved development of a CDD and recommended a class of 17 ships based on a new design T-AO 205 Class with capabilities similar to the T-AO 187 Class.
October 2012	On October 10, 2012, the Navy Gate 3 Review approved the T-AO 205 Class threshold capabilities.
April 2013	An ADM was signed by USD (AT&L) on April 5, 2013, which approved T-AO 205 Program entry at Milestone B.
June 2015	The CDD was approved and validated by the Chief of Naval Operations and JROC on June 16, 2015.
June 2015	Per a USD(AT&L) Memorandum dated June 18, 2015, the Navy received approval to release the Request for Proposals and pursue a combined Milestone B/C.
September 2015	Per a USD(AT&L) Memorandum dated September 11, 2015, the MDA for the T-AO 205 program will be the Assistant Secretary of the Navy (Research, Development, and Acquisition) ASN (RD&A).
June 2016	The Navy awarded a competitive, block buy contract for six ships to General Dynamics, National Steel and Shipbuilding Company on June 30, 2016. The Lead Ship, T-AO 205 was awarded on June 30, 2016.
June 2017	FY 2017 Advance Procurement (AP) for the second ship, T-AO 206 awarded on June 5, 2017.
September 2017	The T-AO 205 Class combined Milestone B/C approval ADM was signed by ASN (RDA) on September 22, 2017.
December 2017	FY 2018 AP for the third ship, T-AO 207 was awarded on December 5, 2017.
March 2018	FY 2018 Full Funding for the second ship, T-AO 206 awarded on March 28, 2018.
May 2018	Per a Navy (Research, Development, and Acquisition) ASN (RD&A) ADM dated May 16, 2018, add two ships to existing contract and increase the LRIP quantity from 6 to 8 ships.
December 2018	FY 2019 Full Funding for the third and fourth ships, T-AO 207 and T-AO 208, and FY 2019 AP for the fifth ship, T-AO 209, was awarded on December 27, 2018.

Threshold Breaches

APB Breaches

Schedule		<input type="checkbox"/>
Performance		<input type="checkbox"/>
Cost	RDT&E	<input type="checkbox"/>
	Procurement	<input type="checkbox"/>
	MILCON	<input type="checkbox"/>
	Acq O&M	<input type="checkbox"/>
O&S Cost		<input type="checkbox"/>
Unit Cost	PAUC	<input type="checkbox"/>
	APUC	<input type="checkbox"/>

Nunn-McCurdy Breaches

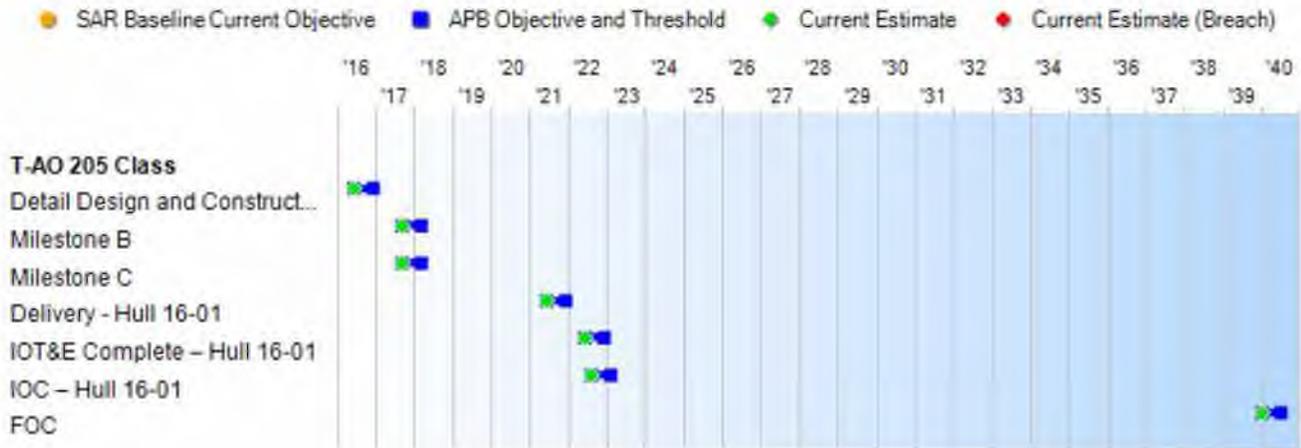
Current UCR Baseline

PAUC	None
APUC	None

Original UCR Baseline

PAUC	None
APUC	None

Schedule



Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate
Detail Design and Construction (DD&C) Award	Jun 2016	Jun 2016	Dec 2016	Jun 2016
Milestone B	Sep 2017	Sep 2017	Mar 2018	Sep 2017
Milestone C	Sep 2017	Sep 2017	Mar 2018	Sep 2017
Delivery - Hull 16-01	Nov 2020	Jun 2021	Dec 2021	Jun 2021 (Ch-1)
IOT&E Complete – Hull 16-01	May 2021	Jun 2022	Dec 2022	Jun 2022 (Ch-1)
IOC – Hull 16-01	Jul 2021	Aug 2022	Feb 2023	Aug 2022 (Ch-1)
FOC	Jan 2036	Jan 2040	Jul 2040	Jan 2040 (Ch-2)

Change Explanations

(Ch-1) The current estimate for Delivery - Hull 16-01 changed from November 2020 to June 2021 to reflect the APB revision that accounts for schedule delays and the impact of the Graving Dock failure.

(Ch-2) The current estimate for FOC changed from January 2036 to January 2040 to reflect the APB revision that updated the total procurement quantity from 17 to 20 ships.

Notes

The Current Estimate for the IOC and IOT&E align with the June 16, 2015 approved CDD which states the IOC will be achieved 14 months after delivery and when the first ship completes Post Delivery Test & Trials, IOT&E, Final Contract Trials, and Post Shakedown Availability. The current PM estimate for these dates are consistent with previous T-Ship actual post-delivery trials durations and IOC.

The IOC objective date reflects the CDD objective date of delivery plus 8 months.

The FY 2016 Lead Hull delivery date is now June 2021 and Obligation Work Limiting Date is August 2022. The Lead Hull initially slipped due to late delivery of main engines and reduction gears, and has been further impacted by the late delivery of pipe spools, vent, and metal outfitting material. The reschedule of yard-wide production efforts due to the Graving Dock incident also compounded the delivery delays.

Acronyms and Abbreviations

IOT&E - Initial Operation Test & Evaluation

Performance

Performance Characteristics				
SAR Baseline Production Estimate	Current APB Production Objective/Threshold	Demonstrated Performance	Current Estimate	
Fueling at Sea				
Cargo Fuel Capacity: 156,000 barrels	Cargo Fuel Capacity: 156,000 barrels	(T=O) Cargo Fuel Capacity: 156,000 barrels	TBD	Cargo Fuel Capacity: 162,164 barrels
Force Protection				
Protect Personnel: Permanent crew-served weapon mounts and ready service lockers for use by on-watch EST Secure stowage for weapons and ammunitions when ship's force security teams and ESTs are not on watch PPE as routinely provided to MSC crews to include Force Protection and CBR PPE for a minimum of 125 personnel	Protect Personnel: Permanent crew-served weapon mounts and ready service lockers for use by on-watch EST Secure stowage for weapons and ammunitions when ship's force security teams and ESTs are not on watch PPE as routinely provided to MSC crews to include Force Protection and CBR PPE for a minimum of 125 personnel	(T=O) Protect Personnel: Permanent crew-served weapon mounts and ready service lockers for use by on-watch EST Secure stowage for weapons and ammunitions when ship's force security teams and ESTs are not on watch PPE as routinely provided to MSC crews to include Force Protection and CBR PPE for a minimum of 125 personnel	TBD	Protect Personnel: Permanent crew-served weapon mounts and ready service lockers for use by on-watch EST Secure stowage for weapons and ammunitions when ship's force security teams and ESTs are not on watch PPE as routinely provided to MSC crews to include Force Protection and CBR PPE for a minimum of 125 personnel.
Survivability				
Vulnerability: Built to commercial standards and meet OPNAVINST 9070.1. The ship will comply with ABS SVR Classification and USCG certification. Vessel will be double-hulled.	Vulnerability: Built to commercial standards and meet OPNAVINST 9070.1. The ship will comply with ABS SVR Classification and USCG certification. Vessel will be double-hulled.	(T=O) Vulnerability: Built to commercial standards and meet OPNAVINST 9070.1. The ship will comply with ABS SVR Classification and USCG certification. Vessel will be double-hulled.	TBD	Vulnerability: Built to commercial standards and meet OPNAVINST 9070.1. The ship will comply with ABS SVR Classification and USCG certification. Vessel will be double-hulled.
Sustainment				
Materiel Availability: 0.74 (Note: Equivalent to 270 Days RFT per year) Operational Availability: 0.95 (Note: Operational AOCF resulting in C4	Materiel Availability: 0.74 (Note: Equivalent to 270 Days RFT per year) Operational Availability: 0.95 (Note: Operational AOCF resulting in C4	(T=O) Materiel Availability: 0.74 (Note: Equivalent to 270 Days RFT per year) Operational Availability: 0.95 (Note: Operational AOCF	TBD	Materiel Availability: 0.78 (Note: Equivalent to 270 Days RFT per year) Operational Availability: 0.96 (Note: Operational AOCF resulting in C4

CASREPs	CASREPs	resulting in C4 CASREPs		CASREPs
Net-Ready				
Perform Logistics and Combat Services: 0.999 Supply Operational Forces: 0.999 Synchronize Supply of Fuel in Joint Operations Area: 0.999 Transmit/Receive Bandwidth between ship and external network: Unclassified (NIPR), Classified (SIPR), and Coalition Network 3.36 Mbps Situational Information; Movement Procedures: Moderate (1-10 sec.) Distribution Data; Transport Data; Coordination Data; Delivery Information: Moderate (1-10 sec.)	Perform Logistics and Combat Services: 0.999 Supply Operational Forces: 0.999 Synchronize Supply of Fuel in Joint Operations Area: 0.999 Transmit/Receive Bandwidth between ship and external network: Unclassified (NIPR), Classified (SIPR), and Coalition Network 3.36 Mbps Situational Information; Movement Procedures: Moderate (1-10 sec.) Distribution Data; Transport Data; Coordination Data; Delivery Information: Moderate (1-10 sec.)	Perform Logistics and Combat Services: 0.99 Supply Operational Forces: 0.99 Synchronize Supply of Fuel in Joint Operations Area: 0.99 Transmit/Receive Bandwidth between ship and external network: Unclassified (NIPR), Classified (SIPR), and Coalition Network 0.889 Mbps Situational Information; Movement Procedures: Slow (10 sec. to 10 min.) Distribution Data; Transport Data; Coordination Data; Delivery Information: Up to 60 min. (10 min. to 60 min.)	TBD	Perform Logistics and Combat Services: 0.999 Supply Operational Forces: 0.999 Synchronize Supply of Fuel in Joint Operations Area: 0.999 Transmit/Receive Bandwidth between ship and external network: Unclassified (NIPR), Classified (SIPR), and Coalition Network 3.36 Mbps Situational Information; Movement Procedures: Moderate (1-10 sec.) Distribution Data; Transport Data; Coordination Data; Delivery Information: Moderate (1-10 sec.)
Energy				
Unrefueled range of 6,000 Nautical Miles at 20 knots while consuming no more than 14,000 barrels of fuel	Unrefueled range of 6,000 Nautical Miles at 20 knots while consuming no more than 14,000 barrels of fuel	(T=O) Unrefueled range of 6,000 Nautical Miles at 20 knots while consuming no more than 14,000 barrels of fuel	TBD	Unrefueled range of 6,000 Nautical Miles at 20 knots while consuming no more than 13,000 barrels of fuel.
Training				
Crew familiarization training on ship-specific systems and equipment to be provided by Contractor MSC will provide training based on CIVMAR) Competency Matrices. Training will occur at MSC-sponsored facilities and at other facilities to include Navy training sites, other Government	Crew familiarization training on ship-specific systems and equipment to be provided by Contractor MSC will provide training based on CIVMAR) Competency Matrices. Training will occur at MSC-sponsored facilities and at other facilities to include Navy training sites, other Government	(T=O) Crew familiarization training on ship-specific systems and equipment to be provided by Contractor MSC will provide training based on CIVMAR) Competency Matrices. Training will occur at MSC-sponsored facilities and at other facilities to include Navy training sites, other	TBD	Crew familiarization training on ship-specific systems and equipment to be provided by Contractor MSC will provide training based on CIVMAR) Competency Matrices. Training will occur at MSC-sponsored facilities and at other facilities to include Navy training sites, other Government

agencies, maritime schools, and other commercial vendors.	agencies, maritime schools, and other commercial vendors.	Government agencies, maritime schools, and other commercial vendors.		agencies, maritime schools, and other commercial vendors.
Space, Weight, Power, and Cooling (SWaP-C)				
Specific SWaP-C margins for future (non-contiguous) installations of self-defense systems to include: -CIWS or SeaRAM -ATTDS - ADC Weight: 68,000 lbs. Space: 500 sq. ft. – above deck space 500 sq. ft. – below deck space Power: 100kW Cooling: 40kW	Specific SWaP-C margins for future (non-contiguous) installations of self-defense systems to include: -CIWS or SeaRAM -ATTDS - ADC Weight: 68,000 lbs. Space: 500 sq. ft. – above deck space 500 sq. ft. – below deck space Power: 100kW Cooling: 40kW	(T=O) Specific SWaP -C margins for future (non-contiguous) installations of self-defense systems to include: -CIWS or SeaRAM -ATTDS - ADC Weight: 68,000 lbs. Space: 500 sq. ft. – above deck space 500 sq. ft. – below deck space Power: 100kW Cooling: 40kW	TBD	Specific SWaP-C margins for future (non-contiguous) installations of self-defense systems to include: -CIWS or SeaRAM -ATTDS - ADC Weight: 68,000 lbs. Space: 500 sq. ft. – above deck space 500 sq. ft. – below deck space Power: 100kW Cooling: 40kW.

Requirements Reference

JROC reviewed and validated the CDD for the Fleet Replenishment Oiler on June 16, 2015. CNO approved updated CDD on February 14, 2017.

Change Explanations

None

Acronyms and Abbreviations

ABS - American Bureau of Shipping
ADC - Acoustic Device, Countermeasure
Aocf - Operational Availability Based on Critical Failures
ATTDS - Anti-Torpedo Torpedo Defense System
C4 CASREPs - Category 4 Casualty Reports
CBR - Chemical, Biological, Radiological
CIVMAR - Civilian Mariner
CIWS - Close-In Weapon System
EST - Expeditionary Security Team
kW - kilowatts
lbs. - pounds
Mbps - Megabits per second
min. - minutes
MSC - Military Sealift Command
NIPR - Non-Secure Internet Protocol Router
OPNAVINST - Operational Navy Instruction
PPE - Personnel Protective Equipment
PRR - Production Readiness Review
RFT - Ready For Tasking
SeaRAM - Rolling Airframe Missile
sec. - seconds
SIPR - Secret Internet Protocol Router
sq. ft. - square feet
SVR - Steel Vessel Rules
SWaP-C - Space, Weight, Power and Cooling
T=O - Threshold equals Objective
USCG - United States Coast Guard

Track to Budget

RDT&E

Appn	BA	PE	
Navy	1319	04	0408042N
	Project	Name	
	0900	Future Combat Logistics Force Development (Shared) (Sunk)	
	Notes: FY 2011 & FY 2012 National Defense Sealift Fund (NDSF) R&D Project 3417.		
Navy	1319	04	0603564N
	Project	Name	
	3375	Ship Prel Design & Feasibility Studies (Sunk)	
	3375C	Ship Prel Design & Feasibility Studies (Sunk)	
	Notes: FY 2014 Congressional Transfer from NDSF R&D to RDT&E.		
	C253	Ship Prel Design & Feasibility Studies (Sunk)	
Navy	1319	05	0605327N
	Project	Name	
	3375	T-AO 205 Class Development	

Procurement

Appn	BA	PE	
Navy	1611	05	0204441N
	Line Item	Name	
	5025	T-AO Fleet Oiler	
	5110	Outfitting (Shared)	
	5300	Completion of Prior Year Shipbuilding Programs (Shared)	

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 2016 \$M			BY 2016 \$M	TY \$M		
	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective	Current Estimate
RDT&E	67.6	67.6	74.4	67.4	67.3	67.3	67.2
Procurement	8475.9	11290.2	12419.2	10822.4	10664.3	14793.8	14076.9
Flyaway	--	--	--	10822.4	--	--	14076.9
Recurring	--	--	--	10713.9	--	--	13960.8
Non Recurring	--	--	--	108.5	--	--	116.1
Support	--	--	--	0.0	--	--	0.0
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	8543.5	11357.8	N/A	10889.8	10731.6	14861.1	14144.1

Current APB Cost Estimate Reference

Update to Program Cost Estimate signed by Cost Engineering and Industrial Analysis, Naval Sea Systems Command (NAVSEA 05C) dated January 16, 2020

Cost Notes

CAPE Cost Risks: Current baseline estimate reflects schedule delays, procurement profile changes, revised labor rates and overhead assumptions, material based on fact finding and actuals, and impact of the NASSCO Graving Dock failure on yard-wide production schedules. The delivery of the Lead Hull is planned for June 2021. If there are any further schedule delays there would be further cost overruns on the Lead Hull and follow ships. The Navy plans to utilize acquisition strategies such as Block Buy contracts to mitigate risk of cost increase in future years.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	0	0	0
Procurement	17	20	20
Total	17	20	20

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2021 President's Budget / December 2019 SAR (TY\$ M)									
Appropriation	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
RDT&E	58.8	1.7	5.1	1.6	0.0	0.0	0.0	0.0	67.2
Procurement	2352.6	1072.7	89.7	132.1	659.8	1075.3	605.8	8088.9	14076.9
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2021 Total	2411.4	1074.4	94.8	133.7	659.8	1075.3	605.8	8088.9	14144.1
PB 2020 Total	2424.5	1081.3	563.8	563.7	1136.0	594.8	769.4	5789.6	12923.1
Delta	-13.1	-6.9	-469.0	-430.0	-476.2	480.5	-163.6	2299.3	1221.0

Quantity Summary										
FY 2021 President's Budget / December 2019 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	4	2	0	0	1	2	1	10	20
PB 2021 Total	0	4	2	0	0	1	2	1	10	20
PB 2020 Total	0	4	2	1	1	2	1	1	8	20
Delta	0	0	0	-1	-1	-1	1	0	2	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding							
1319 RDT&E Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2011	--	--	--	--	--	--	4.5
2012	--	--	--	--	--	--	12.9
2013	--	--	--	--	--	--	25.0
2014	--	--	--	--	--	--	11.1
2015	--	--	--	--	--	--	--
2016	--	--	--	--	--	--	1.0
2017	--	--	--	--	--	--	1.1
2018	--	--	--	--	--	--	1.9
2019	--	--	--	--	--	--	1.3
2020	--	--	--	--	--	--	1.7
2021	--	--	--	--	--	--	5.1
2022	--	--	--	--	--	--	1.6
Subtotal	--	--	--	--	--	--	67.2

Annual Funding 1319 RDT&E Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 2016 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2011	--	--	--	--	--	--	4.7
2012	--	--	--	--	--	--	13.4
2013	--	--	--	--	--	--	25.6
2014	--	--	--	--	--	--	11.2
2015	--	--	--	--	--	--	--
2016	--	--	--	--	--	--	1.0
2017	--	--	--	--	--	--	1.1
2018	--	--	--	--	--	--	1.8
2019	--	--	--	--	--	--	1.2
2020	--	--	--	--	--	--	1.5
2021	--	--	--	--	--	--	4.5
2022	--	--	--	--	--	--	1.4
Subtotal	--	--	--	--	--	--	67.4

Annual Funding 1611 Procurement Shipbuilding and Conversion, Navy							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2016	1	572.1	--	102.1	674.2	--	674.2
2017	--	73.1	--	--	73.1	--	73.1
2018	1	533.1	--	--	533.1	--	533.1
2019	2	1058.2	--	14.0	1072.2	--	1072.2
2020	2	1072.7	--	--	1072.7	--	1072.7
2021	--	89.7	--	--	89.7	--	89.7
2022	--	132.1	--	--	132.1	--	132.1
2023	1	659.8	--	--	659.8	--	659.8
2024	2	1075.3	--	--	1075.3	--	1075.3
2025	1	605.8	--	--	605.8	--	605.8
2026	1	739.0	--	--	739.0	--	739.0
2027	1	771.7	--	--	771.7	--	771.7
2028	1	768.7	--	--	768.7	--	768.7
2029	1	748.7	--	--	748.7	--	748.7
2030	1	785.2	--	--	785.2	--	785.2
2031	1	810.3	--	--	810.3	--	810.3
2032	1	821.0	--	--	821.0	--	821.0
2033	1	839.5	--	--	839.5	--	839.5
2034	1	858.5	--	--	858.5	--	858.5
2035	1	805.3	--	--	805.3	--	805.3
2036	--	40.7	--	--	40.7	--	40.7
2037	--	41.1	--	--	41.1	--	41.1
2038	--	42.3	--	--	42.3	--	42.3
2039	--	16.9	--	--	16.9	--	16.9
Subtotal	20	13960.8	--	116.1	14076.9	--	14076.9

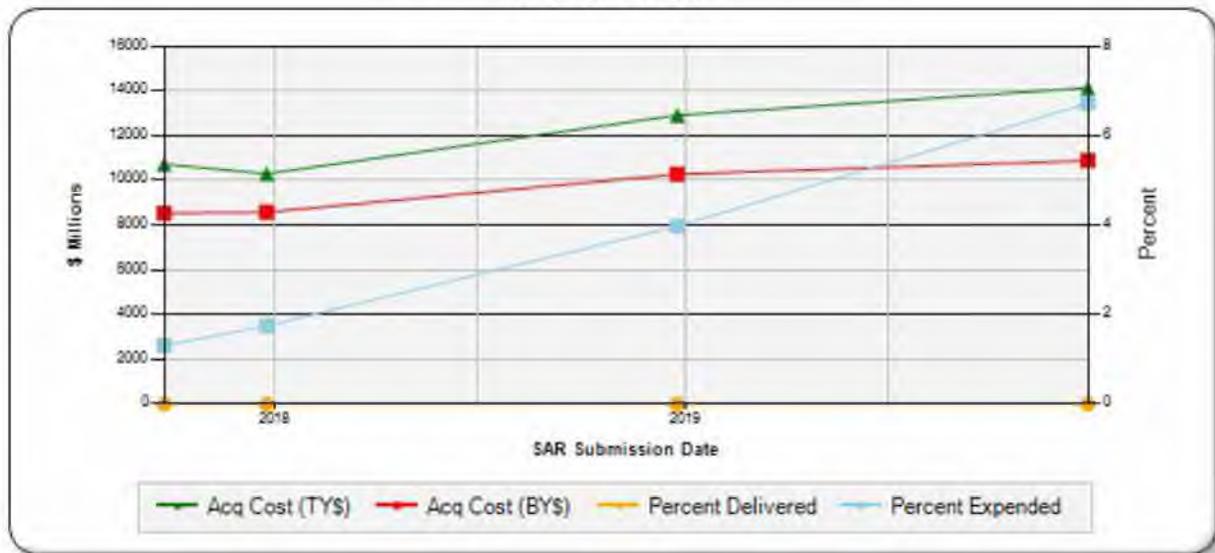
Annual Funding 1611 Procurement Shipbuilding and Conversion, Navy							
Fiscal Year	Quantity	BY 2016 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2016	1	538.7	--	96.1	634.8	--	634.8
2017	--	67.4	--	--	67.4	--	67.4
2018	1	481.7	--	--	481.7	--	481.7
2019	2	937.5	--	12.4	949.9	--	949.9
2020	2	931.7	--	--	931.7	--	931.7
2021	--	76.4	--	--	76.4	--	76.4
2022	--	110.3	--	--	110.3	--	110.3
2023	1	540.0	--	--	540.0	--	540.0
2024	2	862.8	--	--	862.8	--	862.8
2025	1	476.6	--	--	476.6	--	476.6
2026	1	570.0	--	--	570.0	--	570.0
2027	1	583.5	--	--	583.5	--	583.5
2028	1	569.8	--	--	569.8	--	569.8
2029	1	544.1	--	--	544.1	--	544.1
2030	1	559.5	--	--	559.5	--	559.5
2031	1	566.0	--	--	566.0	--	566.0
2032	1	562.3	--	--	562.3	--	562.3
2033	1	563.7	--	--	563.7	--	563.7
2034	1	565.1	--	--	565.1	--	565.1
2035	1	519.7	--	--	519.7	--	519.7
2036	--	25.8	--	--	25.8	--	25.8
2037	--	25.5	--	--	25.5	--	25.5
2038	--	25.7	--	--	25.7	--	25.7
2039	--	10.1	--	--	10.1	--	10.1
Subtotal	20	10713.9	--	108.5	10822.4	--	10822.4

Cost Quantity Information		
1611 Procurement Shipbuilding and Conversion, Navy		
Fiscal Year	Quantity	End Item Recurring Flyaway (Aligned With Quantity) BY 2016 \$M
2016	1	735.0
2017	--	--
2018	1	538.3
2019	2	987.3
2020	2	984.2
2021	--	--
2022	--	--
2023	1	480.5
2024	2	960.8
2025	1	480.1
2026	1	551.1
2027	1	554.2
2028	1	555.3
2029	1	556.7
2030	1	558.2
2031	1	564.4
2032	1	561.4
2033	1	563.2
2034	1	565.2
2035	1	518.0
2036	--	--
2037	--	--
2038	--	--
2039	--	--
Subtotal	20	10713.9

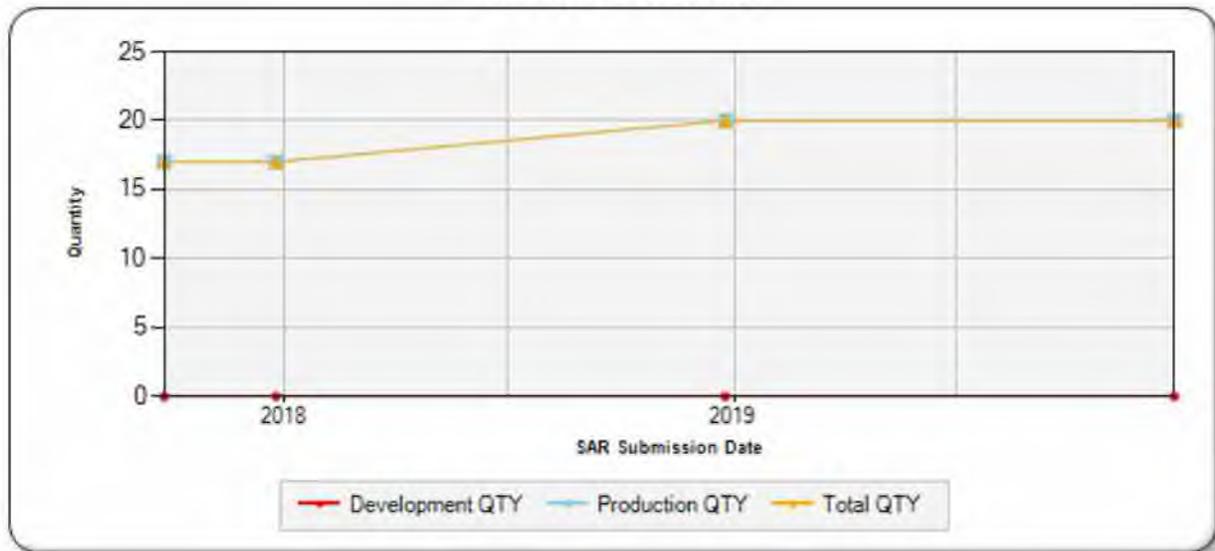
Charts

T-AO 205 Class first began SAR reporting in September 2017

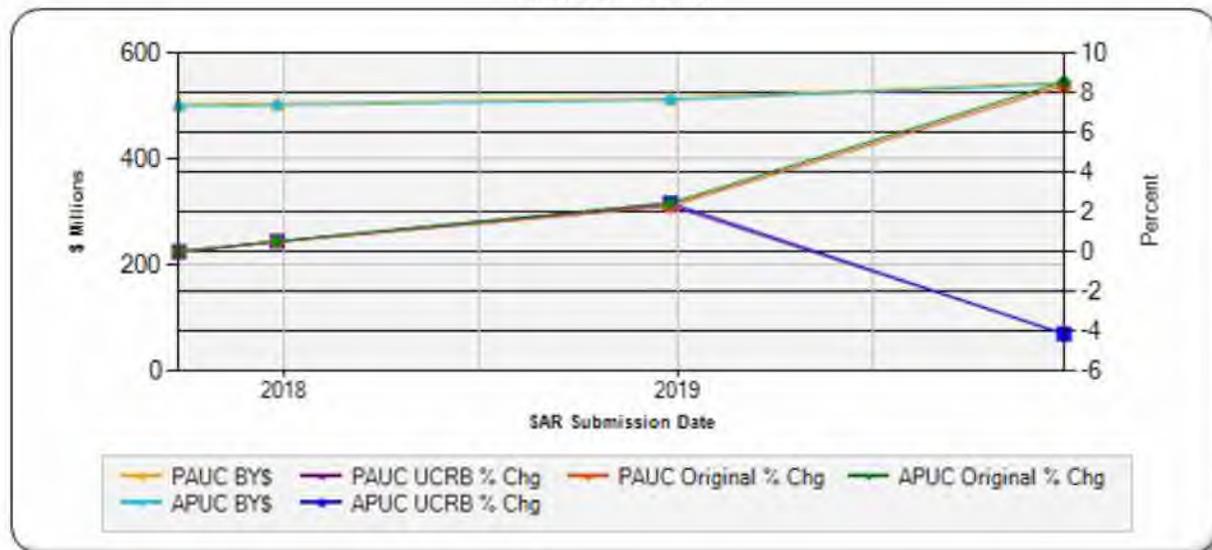
Program Acquisition Cost - T-AO 205 Class
Base Year 2016 \$M



Quantity - T-AO 205 Class



Unit Cost - T-AO 205 Class
Base Year 2016 \$M



Risks

Significant Schedule and Technical Risks

Significant Schedule and Technical Risks	
Milestone B/C (September 2017)	
1.	Lack of future commercial and Navy work (other than current T-AO and ESB) may result in a less efficient construction schedule.
Current Estimate (December 2019)	
1.	Lack of future commercial and Navy work may result in a less efficient construction schedule. There are no known significant technical risks at this time.
2.	The Lead Hull delivery initially slipped due to late delivery of main engines, and reduction gears, and has been further impacted by the late delivery of pipe spools, vent, and metal outfitting material. The latter resulted in later erection of blocks and an overall delay in schedule. This is tied to the reschedule of yard-wide production efforts due to the Graving Dock incident which also compounded the delays. Lead Hull delivery is now June 2021 versus the contractual delivery date of November 2020.

Risks

Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Baseline Estimate (February 2020)	
1.	Current baseline estimate reflects schedule delays, procurement profile changes, revised labor rates and overhead assumptions, material based on fact finding and actuals, and impact of the NASSCO Graving Dock failure on yard-wide production schedules.
Original Baseline Estimate (September 2017)	
1.	Target overhead cost assumed future commercial work, lack of future commercial work may result in an increase in cost.
Revised Original Estimate (N/A)	
None	
Current Procurement Cost (December 2019)	
1.	PB 2021 removed one ship in FY 2021 and one ship in FY 2022 creating a two year gap, which does not impact the six-ship Block Buy contract with National Steel and Shipbuilding Company (NASSCO) or current production schedule.

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	9/22/2017	5/16/2018
Approved Quantity	6	7
Reference	Milestone B/C approval ADM.	Navy (Research, Development, and Acquisition) ASN (RD&A) ADM.
Start Year	2016	2016
End Year	2022	2023

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the award of a block buy contract with National Steel and Shipbuilding Company (NASSCO) for six ships.

LRIP quantity increased per the Assistant Secretary of the Navy (Research, Development, and Acquisition) ADM dated May 16, 2018. Now with Hull 7 Advance Procurement in FY 2022 and Full Rate Production decision occurring in FY 2023, only one additional ship falls within the ADM.

Foreign Military Sales

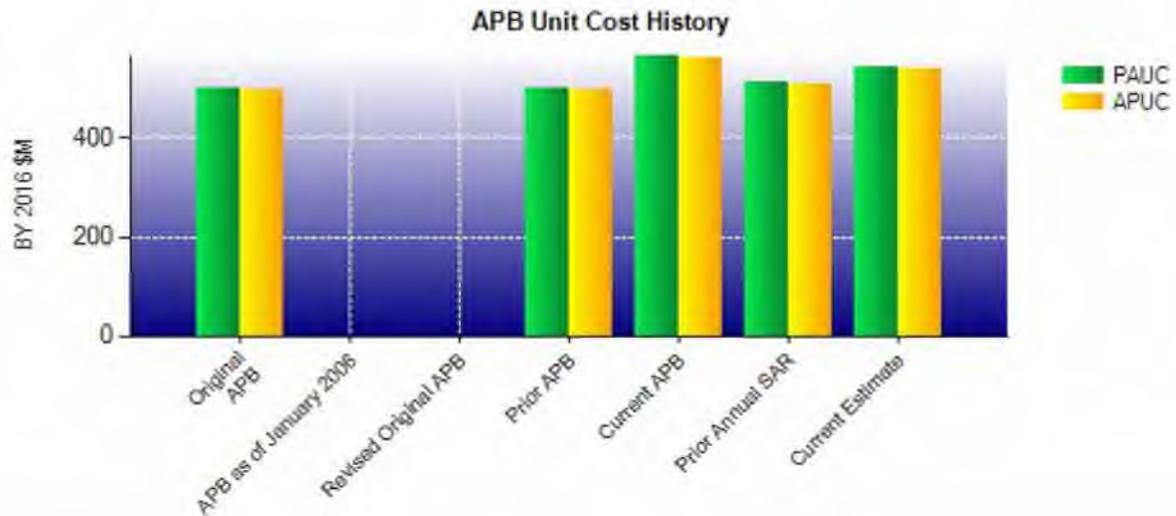
None

Nuclear Costs

None

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2016 \$M	BY 2016 \$M	% Change
	Current UCR Baseline (Feb 2020 APB)	Current Estimate (Dec 2019 SAR)	
Program Acquisition Unit Cost			
Cost	11357.8	10889.8	
Quantity	20	20	
Unit Cost	567.890	544.490	-4.12
Average Procurement Unit Cost			
Cost	11290.2	10822.4	
Quantity	20	20	
Unit Cost	564.510	541.120	-4.14
Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2016 \$M	BY 2016 \$M	% Change
	Original UCR Baseline (Sep 2017 APB)	Current Estimate (Dec 2019 SAR)	
Program Acquisition Unit Cost			
Cost	8543.5	10889.8	
Quantity	17	20	
Unit Cost	502.559	544.490	+8.34
Average Procurement Unit Cost			
Cost	8475.9	10822.4	
Quantity	17	20	
Unit Cost	498.582	541.120	+8.53



APB Unit Cost History					
Item	Date	BY 2016 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Sep 2017	502.559	498.582	631.271	627.312
APB as of January 2006	N/A	N/A	N/A	N/A	N/A
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	Sep 2017	502.559	498.582	631.271	627.312
Current APB	Feb 2020	567.890	564.510	743.055	739.690
Prior Annual SAR	Dec 2018	514.185	510.815	646.155	642.795
Current Estimate	Dec 2019	544.490	541.120	707.205	703.845

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY \$M)										
PAUC Production Estimate	Changes									PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total		
631.271	4.325	12.179	15.745	-0.400	44.085	0.000	0.000	75.934		707.205

Current SAR Baseline to Current Estimate (TY \$M)										
Initial APUC Production Estimate	Changes									APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total		
627.312	4.325	12.773	15.745	-0.400	44.090	0.000	0.000	76.533		703.845

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone A	N/A	N/A	N/A	N/A
Milestone B	N/A	N/A	Sep 2017	Sep 2017
Milestone C	N/A	N/A	Sep 2017	Sep 2017
IOC	N/A	N/A	Jul 2021	Aug 2022
Total Cost (TY \$M)	N/A	N/A	10731.6	14144.1
Total Quantity	N/A	N/A	17	20
PAUC	N/A	N/A	631.271	707.205

Cost Variance

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	67.3	10664.3	--	10731.6
Previous Changes				
Economic	--	+66.0	--	+66.0
Quantity	--	+2137.4	--	+2137.4
Schedule	--	-365.8	--	-365.8
Engineering	--	-8.0	--	-8.0
Estimating	-0.1	+362.0	--	+361.9
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-0.1	+2191.6	--	+2191.5
Current Changes				
Economic	--	+20.5	--	+20.5
Quantity	--	--	--	--
Schedule	--	+680.7	--	+680.7
Engineering	--	--	--	--
Estimating	--	+519.8	--	+519.8
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	+1221.0	--	+1221.0
Total Changes	-0.1	+3412.6	--	+3412.5
Current Estimate	67.2	14076.9	--	14144.1

Summary BY 2016 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	67.6	8475.9	--	8543.5
Previous Changes				
Economic	--	--	--	--
Quantity	--	+1462.8	--	+1462.8
Schedule	--	+41.2	--	+41.2
Engineering	--	-7.4	--	-7.4
Estimating	-0.2	+243.8	--	+243.6
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-0.2	+1740.4	--	+1740.2
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	+259.9	--	+259.9
Engineering	--	--	--	--
Estimating	--	+346.2	--	+346.2
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	+606.1	--	+606.1
Total Changes	-0.2	+2346.5	--	+2346.3
Current Estimate	67.4	10822.4	--	10889.8

Previous Estimate: December 2018

RDT&E	\$M	
	Base Year	Then Year
Current Change Explanations		
Lead Hull delivery date slipped seven months, delaying a portion of Test & Evaluation funding from FY 2021 to FY 2022. (Schedule)	0.0	0.0
RDT&E Subtotal	0.0	0.0

Procurement	\$M	
	Base Year	Then Year
Current Change Explanations		
Revised escalation indices. (Economic)	N/A	+20.5
Shift in procurement buy profile due to the movement of quantities out of FY 2021 – FY 2023 to FY 2024, FY 2034, and FY 2035. (Schedule)	+275.1	+698.0
Additional Schedule variance reflects revised Outfitting and Post Delivery phasing for ships in the FYDP. (Schedule)	-15.2	-17.3
Adjustment for current and prior escalation. (Estimating)	-4.7	-5.2
FY 2020 Defense Appropriations Act reduced Lead Hull Outfitting in FY 2020. (Estimating)	-2.4	-2.7
Revised estimate for ship procurement, Outfitting and Post Delivery in the FYDP. (Estimating)	-129.7	-164.9
Revised estimate for ship procurement and Post Delivery beyond the FYDP. (Estimating)	+483.0	+692.6
Procurement Subtotal	+606.1	+1221.0

Contracts

Contract Identification

Appropriation: Procurement
Contract Name: Detail Design & Construction of T-AO 205
Contractor: General Dynamics, National Steel and Shipbuilding Company (GD NASSCO)
Contractor Location: 2798 Harbor Drive
 San Diego, CA 92113-3650
Contract Number: N00024-16-C-2229/1
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: June 30, 2016
Definitization Date: June 30, 2016

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
N/A	N/A	1	N/A	N/A	1		

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FPIF) contract.

General Contract Variance Explanation

Cost and schedule variances are not reported. In accordance with Section 830(a)(2) of the FY 2020 National Defense Authorization Act, which requires a SAR to be submitted "in unclassified form without any designation relating to dissemination control" this SAR section has omitted information that is ~~For Official Use Only~~.

Contract Identification

Appropriation: Procurement
Contract Name: Detail Design & Construction of T-AO 206
Contractor: GD NASSCO
Contractor Location: 2798 Harbor Drive
 San Diego, CA 92113-3650
Contract Number: N00024-16-C-2229/2
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: June 05, 2017
Definitization Date: June 05, 2017

Contract Price								
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)		
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager	
N/A	N/A	1	N/A	N/A	1			

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FPIF) contract.

General Contract Variance Explanation

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Contract Identification

Appropriation: Procurement
Contract Name: Detail Design & Construction of T-AO 207
Contractor: GD NASSCO
Contractor Location: 2798 Habor Drive
 San Diego, CA 92113-3650
Contract Number: N00024-16-C-2229/3
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: December 05, 2017
Definitization Date: December 05, 2017

Contract Price								
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)		
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager	
N/A	N/A	1	N/A	N/A	1			

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FPIF) contract.

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Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	0	0	20	0.00%
Total Program Quantity Delivered	0	0	20	0.00%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	14144.1	Years Appropriated	10
Expended to Date	951.7	Percent Years Appropriated	34.48%
Percent Expended	6.73%	Appropriated to Date	3485.8
Total Funding Years	29	Percent Appropriated	24.64%

The above data is current as of February 10, 2020.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	January 16, 2020
Source of Estimate:	Program Cost Estimate signed by Cost Engineering & Industrial Analysis, NAVSEA 05C
Quantity to Sustain:	20
Unit of Measure:	Ship
Service Life per Unit:	40.00 Years
Fiscal Years in Service:	FY 2021 - FY 2075

The procurement and sustainment quantity has increased from 17 to 20 ships. Unit Operations has been updated to represent the most recent price per barrel. Estimate also includes current Operations & Maintenance, Navy inflation rates.

Sustainment Strategy

The Military Sealift Command (MSC) maintains the T-AO Fleet Replenishment Oilers utilizing established sustainment practices and maintenance philosophy which reflect the ship's commercial design and construction, utilization of commercial equipment and MSC's two-level maintenance philosophy consisting of shipboard and depot level maintenance. Sustainment efforts follow commercial merchant service practices that emphasize maximizing cost effectiveness and ship availability. Operating Tempo was assumed 55% of In Fleet Time (IFT) steaming underway and 45% of IFT steaming not underway, the average of the Dry Cargo/Ammunition Ship (T-AKE) Visibility and Management of Operating and Support Costs (VAMOSOC) data and the T-AO 201-204 data.

Antecedent Information

The Antecedent Systems are the T-AO 187 Class (specifically hulls T-AO 201-204) and T-AKE 1 Class as these are the most recent double-hulled auxiliary ships. The T-AO 201-204 and T-AKE 1-14 estimates were derived using the VAMOSOC database and the MSC Indirect values. The years of data used for T-AO 201-204 was FY 1993 through FY 2015. The years of data used for T-AKE 1-14 was FY 2006 through FY 2015.

Cost Element	Annual O&S Costs BY2016 \$M	
	T-AO 205 Class Average Annual Cost Per Ship	T-AO 187 Class (Antecedent) Average Annual Cost Per Ship
Unit-Level Manpower	8.750	9.000
Unit Operations	9.580	11.000
Maintenance	9.440	6.000
Sustaining Support	0.339	1.000
Continuing System Improvements	0.450	1.000
Indirect Support	12.280	11.000
Other	--	--
Total	40.839	39.000

Item	Total O&S Cost \$M			
	T-AO 205 Class			T-AO 187 Class (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	32671.0	35938.1	32671.2	N/A
Then Year	72352.0	N/A	72352.0	N/A

Equation to Translate Annual Cost to Total Cost

Total O&S Cost = 20 ships x \$40.839M Average Annual Cost per ship x 40 year service life.

O&S Cost Variance		
Category	BY 2016 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2018 SAR	27837.4	
Programmatic/Planning Factors	4912.2	Quantity increase from 17 to 20 ships
Cost Estimating Methodology	0.0	
Cost Data Update	177.6	Update to O&M,N inflation rates
Labor Rate	0.0	
Energy Rate	-256.0	Reduction in fuel pricing
Technical Input	0.0	
Other	0.0	
Total Changes	4833.8	
Current Estimate	32671.2	

Disposal Estimate Details

Date of Estimate: January 16, 2020
Source of Estimate: Program Cost Estimate
Disposal/Demilitarization Total Cost (BY 2016 \$M): 87.5

Disposal costs account for the inactivation cost and the net disposal (scrap) cost. The T-AO 205 is not currently being considered as a remobilization asset, therefore no costs are set aside for that effort once the ship is decommissioned and taken out of service.