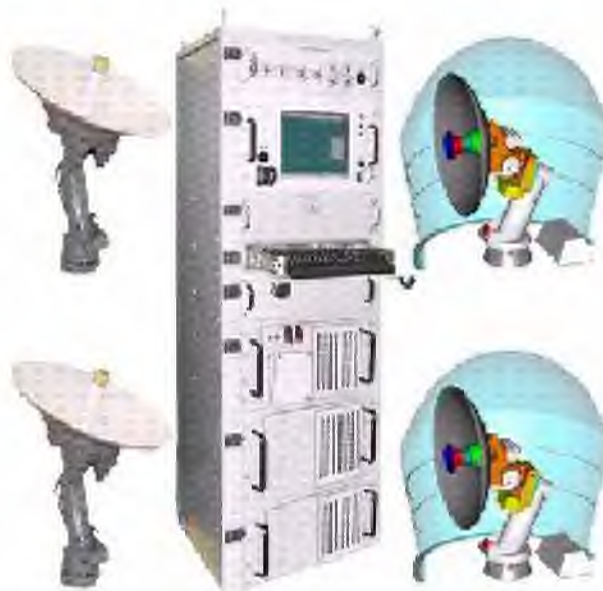


UNCLASSIFIED



Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-290



Navy Multiband Terminal (NMT)

As of FY 2019 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

UNCLASSIFIED

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Sensitivity Originator

No originator info Available at this time.

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)

Program Information

Program Name

Navy Multiband Terminal (NMT)

DoD Component

Navy

Responsible Office

CAPT Andrew Gibbons
4301 Pacific Coast Highway
San Diego, CA 92110-3127

andy.gibbons@navy.mil

Phone: 619-524-7930

Fax: 619-524-3501

DSN Phone: 524-7930

DSN Fax:

Date Assigned: November 16, 2017

References

SAR Baseline (Production Estimate)

Navy Acquisition Executive (NAE) Approved Acquisition Program Baseline (APB) dated October 4, 2010

Approved APB

Navy Acquisition Executive (NAE) Approved Acquisition Program Baseline (APB) dated March 11, 2016

Mission and Description

The Navy Multiband Terminal (NMT) Program is the next generation maritime military satellite communications terminal. The NMT Program is the required Navy component to the Advanced Extremely High Frequency (AEHF) Program for enhancing protected and survivable satellite communications for Naval forces. NMT multiband capabilities will communicate via two way Ka-Band on Wideband Global Satellite Communication (SATCOM) (WGS) and via X-Band on the Defense Satellite Communications System and WGS. NMT will operate in the Extremely High Frequency (EHF)/AEHF Low Data Rate, Medium Data Rate, and Extended Data Rate communication modes. NMT will sustain the Military SATCOM architecture by providing connectivity across the spectrum of mission areas to include land, air, and naval warfare, special operations, strategic nuclear operations, strategic defense, theater missile defense, and space operations and intelligence. The NMT system will replenish and improve on the capabilities of both the MILSTAR system and WGS system by equipping the warfighters with the assured, jam resistant, secure communications as described in the ORD for the joint AEHF Satellite Communications (AFSPC ORD 004-99, October 2000) and WGS System (Wideband Gapfiller System ORD, May 3, 2000), the NMT CPD (NMT CPD 769-6F-08, November 18, 2008), and the NMT-WAMS CPD (NMT-WAMS CPD 914-26F-16, October 28, 2016). The AEHF system will provide crosslinks within the constellation as well as between AEHF satellites and MILSTAR satellites in the backwards-compatible mode. Mission requirements specific to Navy operations, including threat levels and scenarios, are contained in the AEHF ORD. NMT will be a FORCEnet enabler by providing critical protected bandwidth for warfighter information services.

Executive Summary

Program Highlights Since Last Report

This is the final SAR submission for the NMT program.

Pursuant to section 2432 of title 10, United States Code, this is the final SAR submission for NMT, because the program is 90% or more delivered.

NMT is currently operating well within cost, schedule, and performance parameters. Based on operational testing results, validated cost estimates, and ongoing risk management, it is expected that the program will continue to operate within these parameters.

NMT budgeted procurement funds in FY 2018 - FY 2022 for the fielding of Assured Command and Control (AC2) modems. The modem upgrades improve the AC2 posture and provide Satellite Communications reliability and space resiliency. NMT provides connectivity across the spectrum of mission areas and improves the capabilities of both the MILSTAR system and Wideband Global Satellite Communication system by equipping the warfighters with assured, jam resistant, and secure communications.

NMT held a successful Gate 6/Configuration Steering Board review on November 30, 2017. The purpose of the review was to request authority to execute funding in FY 2018 and beyond for procurement and fielding of the AC2 modem; execution of the funding was approved by the Assistant Secretary of the Navy for Research, Development, and Acquisition.

On December 19, 2017, NMT exercised the Production Year 8 option for a buy of 1 NMT program of record terminal and 10 Other Customer Funded terminals.

As of February 12, 2018, NMT has fielded 167 of the 219 terminals delivered to date.

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

History of Significant Developments Since Program Initiation

History of Significant Developments Since Program Initiation	
Date	Significant Development Description
October 2003	Conducted a successful Milestone B review. The Assistant Secretary of the Navy for Research, Development and Acquisition (ASN (RDA)) approved entry into the System Development and Demonstration Phase and the award of contracts for the purpose of design and development of ship, submarine and shore terminal prototypes and Engineering Design Models.
October 2003	Competitively awarded dual 30-month, Cost Plus Award Fee contracts for development of a NMT Q-band prototype to Harris Corporation and Raytheon Company.
May 2005	Held the NMT Critical Design Review.
August 2006	The USD AT&L officially designated NMT as a MDAP ACAT IC program.
May 2007	Prototype Testing was completed by both prime vendors (Harris Corporation and Raytheon Company). Based on the results of the testing, NMT down selected to a single prime contractor, Raytheon Company.
June 2008	The Office of Naval Research released its initial Technology Readiness Assessment for NMT and all Critical Technology Elements were assessed at a Technology Readiness Level of 6 or higher.
November 2008	The NMT CPD was approved.
March 2010	The program held a successful Operational Assessment.
July 2010	Conducted a successful Gate 6 / Milestone C Review that resulted in approval to procure 90 LRIP systems.
September 2010	Exercised the first production option for a total of 22 terminals.
October 2010	ASN (RDA) approved the Milestone C APB.
March 2011	ASN (RDA) signed a revised ADM authorizing NMT to procure an additional 42 units (22 units for NMT and 20 units for other customers).
July 2011	Start of Initial Operational Test and Evaluation (IOT&E).
January 2012	ASN (RDA) authorized an extended year of LRIP in a Gate 6 Review to continue with PY3 procurement.
October 2012	Closure of the sustainability deficiencies from IOT&E was conducted through the completion of a Verification of Correction of Deficiencies reported by the Navy's Commander Operational Test and Evaluation Force. The report resulted in the NMT system being assessed as operationally effective and operationally suitable, and recommended NMT for further Fleet introduction.
November 2012	Conducted a successful Gate 6 / Full-Rate Production Decision Review (FRP-DR). The resulting ADM authorized full production and installation for the NMT Program of Record and Other Customers, which allowed the program to award the first phase of the PY4 production buy for 14 units.
December 2012	Office of the Chief of Naval Operations Code N2/N6 declared IOC for the NMT System.
April 2013	ASN (RDA) approved the FRP-DR APB.
April 2013	The Advanced Time Division Multiple Access Interface Processor (ATIP) contract for the development and production of ATIP, a 2-layer Ethernet bridging device critical to enhancing NMT functionality, was awarded to COMTECH EF Data in Tempe, Arizona.
June 2013	Completed the PY4 buy, procuring an additional 20 systems to bring the total PY4 buy to 34 systems.
December 2013	During Over-the-Air and Anti-Jam/Low Probability of Intercept field testing, the USS Cole (DDG-67) became the first US Navy platform to achieve operational use of the Advanced Extremely High Frequency (AEHF) capability, using NMT to operate with the Extended Data Rate waveform on an

	AEHF satellite.
December 2013	Initiated the PY5 Extension buy, procuring 38 systems.
June 2014	Completed the PY5 buy with the procurement of 3 terminals, bringing the PY5 total to 41 systems.
June 2014	Conducted a successful Gate 6 / Configuration Steering Board (CSB), after which ASN (RDA) approved the addition of Adaptive Coding (AC).
August 2014	COMTECH EF Data was awarded the first ATIP production buy for 125 units.
September 2014	Submitted a Program Deviation Report to address the Total RDT&E cost deviation caused by the addition of AC.
December 2014	Executed a PY5 Extension buy, procuring 17 terminals, bringing the total number of Other Procurement, Navy (OPN) funded systems to 205.
November 2015	ASN (RDA) approved the addition of the Wideband Anti-Jam Modem System (WAMS) capability to the NMT program baseline in support of A2AD initiatives.
December 2015	Awarded the Follow-On Full Deployment production contract to Raytheon. At the time of award, the program procured 12 program of record terminals.
March 2016	ASN (RDA) approved an APB update, adding AC and WAMS to the program baseline.
September 2016	NMT held a successful Gate 6/CSB review on September 7, 2016. The purpose of the review was to request authority to execute funding for WAMS development and testing in FY 2017 and beyond in support of command and control in a denied or degraded environment; execution of the funding was approved by the ASN (RDA).
October 2016	On October 28, 2016, the JROC Memorandum was signed by the Vice Chairman of the Joint Chiefs of Staff, validating the CPD Increment 1 for the NMT WAMS and validating its KPPs.
December 2016	On December 29, 2016, NMT exercised the PY 7 option for a buy of 2 NMT program of record terminals and 5 Other Customer Funded terminals.

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	
Milestone B	Oct 2003	Oct 2003	Oct 2003	Oct 2003
System Development & Demonstration Contract Award	Oct 2003	Oct 2003	Oct 2003	Oct 2003
Critical Design Review	May 2005	May 2005	May 2005	May 2005
Operational Assessment	Sep 2009	Mar 2010	Mar 2010	Mar 2010
Milestone C	Feb 2010	Aug 2010	Aug 2010	Aug 2010
Initial Operational Test and Evaluation (Start)	Apr 2012	Jul 2011	Jul 2011	Jul 2011
Full Rate Production Decision Review	Sep 2012	Nov 2012	Nov 2012	Nov 2012
IOC	Sep 2012	Dec 2012	Dec 2012	Dec 2012

Change Explanations

None

Performance

Performance Characteristics				
SAR Baseline Production Estimate	Current APB Production Objective/Threshold	Demonstrated Performance	Current Estimate	
NMT Antenna Control Coverage				
The NMT shall be capable of pointing and tracking satellites with elevation angles of 0 deg (20 deg for the mast) above the horizon and 360 deg in azimuth with full platform dynamics. In the absence of sea state or submarine dynamics, the antenna shall have the capability to point at satellites down to 0 deg relative to the horizon.	The NMT shall be capable of pointing and tracking satellites with elevation angles of 0 deg (20 deg for the mast) above the horizon and 360 deg in azimuth with full platform dynamics. In the absence of sea state or submarine dynamics, the antenna shall have the capability to point at satellites down to 0 deg relative to the horizon.	The NMT shall be capable of pointing and tracking satellites with elevation angles of 10 deg (20 deg for the mast) above the horizon and 360 deg in azimuth with full platform dynamics.	Demonstrated capability to acquire and track Milstar, WGS, and DSCS satellites.	The NMT shall be capable of pointing and tracking satellites with elevation angles of 0 deg (20 deg for the mast) above the horizon and 360 deg in azimuth with full platform dynamics. In the absence of sea state or submarine dynamics, the antenna shall have the capability to point at satellites down to 0 deg relative to the horizon.
Sustainment				
Material Availability				
>= 0.95	>= 0.95	>= 0.75	Ship: 0.98, Sub: 0.99, Shore: 0.99	>= 0.95
Operational Availability (Ao)				
>0.999 (sub) > 0.999 (ship/shore)	>0.999 (sub) > 0.999 (ship/shore)	> 0.940 (sub) > 0.900 (ship/shore)	Ship: 0.98, Sub: 0.99, Shore: 0.99	>0.999 (sub) > 0.999 (ship/shore)
Reliability				
Material Reliability – Mean Time Between Failure (MTBF)				
>= 2200 hrs	>= 2200 hrs	>= 1100 hrs	Ship: 1,460 hrs (10/15/2012) Sub: 216.95 hrs (11/14/2011) Shore: 700.5 hrs (10/15/2012)	>= 2200 hrs
Material Reliability - Mean Time Between Critical Failure (MTBCF)				
>= 4200 hrs	>= 4200 hrs	>= 1400 hrs	Ship: 1,460 hrs (10/15/2012) Sub: 216.95 hrs (11/14/2011) Shore:	>= 4200 hrs

			700.5 hrs (10/15/2012)	
Maintainability				
Mean Time to Repair (MTTR)				
<= 1 hr	<= 1 hr	<= 3 hrs	Ship: 1.18 hrs (10/15/2012) Shore: 1.25 hrs (11/14/2011) Sub: 4.3 hrs (11/14/2011)	<= 1 hr
Cost				
Ownership Cost				
<= \$298M	<= \$253M	<= \$278M	\$259.8M	<= \$278M (Ch-1)
Survivability				
Survive an EMP (AEHF Only)				
NMT AEHF/EHF functionality shall be capable of surviving indirect nuclear detonation EMP and thermal blast effects as defined in ELEX-S-488G and SR-3000 Appendix B-8.4	NMT AEHF/EHF functionality shall be capable of surviving indirect nuclear detonation EMP and thermal blast effects as defined in ELEX-S-488G and SR-3000 Appendix B-8.4	NMT AEHF/EHF functionality shall be capable of surviving indirect nuclear detonation EMP and thermal blast effects as defined in ELEX-S-488G and SR-3000 Appendix B-8.4	TBD	NMT AEHF/EHF functionality shall be capable of surviving indirect nuclear detonation EMP and thermal blast effects as defined in ELEX-S-488G and SR-3000 Appendix B-8.4
NMT Multiband Terminal Operations				
NMT shall provide AEHF/EHF capability with two-way military Ka-band (ship only), GBS (sub/ship) and X-band (ship /subs) simultaneously. The NMT shall operate in the EHF/AEHF LDR, MDR, and XDR communication modes.	NMT shall provide AEHF/EHF capability with two-way military Ka-band (ship only), GBS (sub/ship) and X-band (ship /subs) simultaneously. The NMT shall operate in the EHF/AEHF LDR, MDR, and XDR communication modes.	NMT shall provide AEHF/EHF capability with two-way military Ka-band (ship only), GBS (sub/ship) and X-band (ship/subs). The NMT shall operate in the EHF/AEHF LDR, MDR, and XDR communication modes.	TBD	NMT shall provide AEHF/EHF capability with two-way military Ka-band (ship only), GBS (sub/ship) and X-band (ship /subs) simultaneously. The NMT shall operate in the EHF/AEHF LDR, MDR, and XDR communication modes.
Net-Ready				
The system must fully support execution of all operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for	The system must fully support execution of all operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for	The system must fully support execution of joint critical operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical	Interoperability: NMT is capable of supporting operations in the joint operations environment. The NMT interfaced and operated with other communications systems over Milstar, WGS, and DSCS satellite systems. The	The system must fully support execution of all operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for

transition to Net-Centric military operations to include: 1) DISR mandated GIG IT standards and profiles identified in the TV-1 2) DISR mandated GIG KIPs identified in the KIP declaration table 3) NCOW RM Enterprise Services 4) Information assurance requirements resulting in issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	transition to Net-Centric military operations to include: 1) DISR mandated GIG IT standards and profiles identified in the TV-1 2) DISR mandated GIG KIPs identified in the KIP declaration table 3) NCOW RM Enterprise Services 4) Information assurance requirements resulting in issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	requirements for Net-Centric military operations to include: 1) DISR mandated GIG IT standards and profiles identified in the TV-1 2) DISR mandated GIG KIPs identified in the KIP declaration table 3) NCOW RM Enterprise Services 4) Information assurance requirements resulting in issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	NMTs conducted end-to-end communications with other NMTs and legacy EHF and SHF terminals. During testing and ongoing operations, the Navy sent a large number of e-mails through the Secure Internet Protocol Router Network (SIPRNET) as their preferred mode of communications. Information Assurance: The Navy Information Operations Command performed information assurance testing during the integrated test period.	transition to Net-Centric military operations to include: 1) DISR mandated GIG IT standards and profiles identified in the TV-1 2) DISR mandated GIG KIPs identified in the KIP declaration table 3) NCOW RM Enterprise Services 4) Information assurance requirements resulting in issuance of an ATO by the DAA, and 5) Operationally effective information exchanges; and mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.
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Sustainment - WAMS**Materiel Availability - WAM**

N/A	>= 0.75	(T=O) >= 0.75	TBD	>= 0.75
-----	---------	---------------	-----	---------

Materiel Availability - Mini-Hub

N/A	>= 0.75	(T=O) >= 0.75	TBD	>= 0.75
-----	---------	---------------	-----	---------

Ao - WAM

N/A	>= 0.96	(T=O) >= 0.96	TBD	>= 0.96
-----	---------	---------------	-----	---------

Ao - Mini-Hub

N/A	>= 0.96	(T=O) >= 0.96	TBD	>= 0.96
-----	---------	---------------	-----	---------

Reliability**MTBF - WAM**

N/A	>= 30,000 hrs	(T=O) >= 30,000 hrs	TBD	>= 30,000 hrs
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MTBF - Mini-Hub

N/A	>= 8,900 hrs	(T=O) >= 8,900 hrs	TBD	>= 8,900 hrs
-----	--------------	--------------------	-----	--------------

Maintainability				
MTTR - WAM				
N/A	< 1 hour	(T=O) < 1 hour	TBD	< 1 hour
MTTR - Mini-Hub				
N/A	< 1 hour	(T=O) < 1 hour	TBD	< 1 hour
Benign Data Rates - WAMS				
Ship X-band large X/Ka antenna				
N/A	>=13.7 Mbps (measured on the return link from the ship WAM to shore hub); >=15.9 Mbps (measured on the forward link from shore hub to ship WAM)	(T=O) >=13.7 Mbps (measured on the return link from the ship WAM to shore hub); >=15.9 Mbps (measured on the forward link from shore hub to ship WAM)	TBD	>=13.7 Mbps (measured on the return link from the ship WAM to shore hub); >=15.9 Mbps (measured on the forward link from shore hub to ship WAM)
Ship X-band small X/Ka antenna				
N/A	>=4.1 Mbps (measured on the return link from ship WAM to shore hub); >=3.2 Mbps (measured on the forward link from shore hub to ship WAM)	(T=O) >=4.1 Mbps (measured on the return link from ship WAM to shore hub); >=3.2 Mbps (measured on the forward link from shore hub to ship WAM)	TBD	>=4.1 Mbps (measured on the return link from ship WAM to shore hub); >=3.2 Mbps (measured on the forward link from shore hub to ship WAM)
Submarine X-band				
N/A	>=300 Kbps (measured on the return link from the submarine WAM to the shore hub); >=300 Kbps (measured on the forward link from shore hub to submarine WAM)	(T=O) >=300 Kbps (measured on the return link from the submarine WAM to the shore hub); >=300 Kbps (measured on the forward link from shore hub to submarine WAM)	TBD	>=300 Kbps (measured on the return link from the submarine WAM to the shore hub); >=300 Kbps (measured on the forward link from shore hub to submarine WAM)

Classified Performance information is provided in the classified annex to this submission.

Requirements Reference

The requirements are referenced in two documents, the NMT Capability Production Document (CPD) dated November 18, 2008 and the draft NMT CPD Increment 1 for Wideband Anti-Jam Modem System (WAMS).

Change Explanations

(Ch-1) The current estimate for Ownership Cost was revised to reflect the inventory objective quantity update from 250 to 239.

Notes

Demonstrated Performance metrics for MTTR reflect the results of the IOT&E and Verification of Correction of Deficiencies.

On October 28, 2016, the Joint Requirements Oversight Council Memorandum was signed by the Vice Chairman of the Joint Chiefs of Staff, validating the CPD Increment 1 for the NMT WAMS and validating its KPPs.

Acronyms and Abbreviations

AEHF - Advanced Extremely High Frequency
 ATO - Approval to Operate
 DAA - Designated Approval Authority
 deg - degree
 DISR - DoD Information Standards Registry
 DSCS - Defense Satellite Communication System
 EHF - Extremely High Frequency
 EMP - Electro Magnetic Pulse
 GBS - Global Broadcast Service
 GIG - Global Information Grid
 hrs - hours
 IOT&E - Initial Operational Test and Evaluation
 IT - Information Technology
 KIP - Key Interface Profile
 LDR - Low Data Rate
 MDR - Medium Data Rate
 MTBCF - Mean Time Between Critical Failure
 MTBF - Mean Time Between Failure
 MTTR - Mean Time to Repair
 NCOW RM - Net-Centric Operational Warfare Reference Model
 SHF - Super High Frequency
 sub - submarine
 TV - Technical View
 WAM - Wideband Anti-Jam Modem
 WAMS - Wideband Anti-Jam Modem System
 WGS - Wideband Global SATCOM
 XDR - Extended Data Rate

Track to Budget

RDT&E

Appn	BA	PE	
Navy	1319	07	0303109N
	Project	Name	
	0728	EHF SATCOM Terminals (Shared)	
	9889	Navy Multiband Terminal (Shared) (Sunk)	
Navy	1319	07	1203109N
	Project	Name	
	0728	EHF SATCOM Terminals (Shared)	

Procurement

Appn	BA	PE	
Navy	1810	02	0303109N
	Line Item	Name	
	3216	Navy Multiband Terminal (Sunk)	
Navy	1810	02	1203109N
	Line Item	Name	
	3216	Navy Multiband Terminal	

Notes

RDT&E and Other Procurement, Navy (OPN) funding is being realigned from Program Element (PE) 0303109N to 1203109N. RDT&E funding is moved to the new PE starting in FY 2018 and OPN funding is realigned to the new PE starting in FY 2017.

Line item 9020 is a shared control number and is not included in the NMT APB. As a result, it is not shown in the above Track to Budget.

Cost and Funding

Cost Summary

Total Acquisition Cost						
Appropriation	BY 2002 \$M			BY 2002 \$M	TY \$M	
	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective
RDT&E	555.9	729.8	802.8	750.7	631.3	868.6
Procurement	962.0	1041.6	1145.8	1094.6	1221.7	1368.4
Flyaway	--	--	--	1094.6	--	--
Recurring	--	--	--	525.6	--	--
Non Recurring	--	--	--	569.0	--	--
Support	--	--	--	0.0	--	--
Other Support	--	--	--	0.0	--	--
Initial Spares	--	--	--	0.0	--	--
MILCON	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
Total	1517.9	1771.4	N/A	1845.3	1853.0	2237.0

Current APB Cost Estimate Reference

The NMT Cost Section is based on the Naval Center for Cost Analysis (NCCA) Component Cost Position (CCP) memo dated December 18, 2015

Cost Notes

In accordance with Section 842 of the National Defense Authorization Act for FY 2017, which amended title 10 U.S.C. § 2334, the Director of Cost Assessment and Program Evaluation, and the Secretary of the military department concerned or the head of the Defense Agency concerned, must issue guidance requiring a discussion of risk, the potential impacts of risk on program costs, and approaches to mitigate risk in cost estimates for MDAPs and major subprograms. The information required by the guidance is to be reported in each SAR. This guidance is not yet available; therefore, the information on cost risk is not contained in this SAR.

NMT costs are based on the November 2017 Program Lifecycle Cost Estimate update.

Procurement costs in FY 2024 - FY 2028 are for the Wideband Anti-Jam Modem System (WAMS). Because WAMS is not an NMT end item, there are no quantities associated with the costs.

FY 2018 - FY 2021 procurement includes the cost to field the Assured Command and Control modems.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	28	28	28
Procurement	276	250	239
Total	304	278	267

Quantity Notes

The original NMT inventory objective was 276 but the quantity has been reduced to 239 due to revised Navy requirements. The Navy is currently routing a letter for signature that will officially change the inventory objective to 239.

The NMT unit of measure is defined as a single terminal, to include the Communication Group, Antennas, and Radomes.

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2019 President's Budget / December 2017 SAR (TY\$ M)									
Appropriation	Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	To Complete	Total
RDT&E	717.0	22.3	17.7	32.8	33.4	39.0	39.8	0.3	902.3
Procurement	1005.5	69.8	113.9	92.2	21.5	31.3	19.1	91.4	1444.7
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 2019 Total	1722.5	92.1	131.6	125.0	54.9	70.3	58.9	91.7	2347.0
PB 2018 Total	1723.4	92.2	118.8	131.2	57.0	55.2	60.1	89.3	2327.2
Delta	-0.9	-0.1	12.8	-6.2	-2.1	15.1	-1.2	2.4	19.8

Quantity Summary										
FY 2019 President's Budget / December 2017 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	To Complete	Total
Development	28	0	0	0	0	0	0	0	0	28
Production	0	219	2	6	12	0	0	0	0	239
PB 2019 Total	28	219	2	6	12	0	0	0	0	267
PB 2018 Total	28	219	2	4	16	0	0	9	0	278
Delta	0	0	0	2	-4	0	0	-9	0	-11

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	
2001	--	--	--	--	--	--	--	3.4
2002	--	--	--	--	--	--	--	6.6
2003	--	--	--	--	--	--	--	29.4
2004	--	--	--	--	--	--	--	64.1
2005	--	--	--	--	--	--	--	58.1
2006	--	--	--	--	--	--	--	55.4
2007	--	--	--	--	--	--	--	77.7
2008	--	--	--	--	--	--	--	87.7
2009	--	--	--	--	--	--	--	108.7
2010	--	--	--	--	--	--	--	78.8
2011	--	--	--	--	--	--	--	18.1
2012	--	--	--	--	--	--	--	17.5
2013	--	--	--	--	--	--	--	28.1
2014	--	--	--	--	--	--	--	19.8
2015	--	--	--	--	--	--	--	18.2
2016	--	--	--	--	--	--	--	27.2
2017	--	--	--	--	--	--	--	18.2
2018	--	--	--	--	--	--	--	22.3
2019	--	--	--	--	--	--	--	17.7
2020	--	--	--	--	--	--	--	32.8
2021	--	--	--	--	--	--	--	33.4
2022	--	--	--	--	--	--	--	39.0
2023	--	--	--	--	--	--	--	39.8
2024	--	--	--	--	--	--	--	0.3
Subtotal	28	--	--	--	--	--	--	902.3

Annual Funding							
1319 RDT&E Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 2002 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2001	--	--	--	--	--	--	3.4
2002	--	--	--	--	--	--	6.5
2003	--	--	--	--	--	--	28.8
2004	--	--	--	--	--	--	61.0
2005	--	--	--	--	--	--	53.9
2006	--	--	--	--	--	--	49.8
2007	--	--	--	--	--	--	68.2
2008	--	--	--	--	--	--	75.6
2009	--	--	--	--	--	--	92.5
2010	--	--	--	--	--	--	66.1
2011	--	--	--	--	--	--	14.8
2012	--	--	--	--	--	--	14.1
2013	--	--	--	--	--	--	22.4
2014	--	--	--	--	--	--	15.6
2015	--	--	--	--	--	--	14.1
2016	--	--	--	--	--	--	20.8
2017	--	--	--	--	--	--	13.7
2018	--	--	--	--	--	--	16.5
2019	--	--	--	--	--	--	12.8
2020	--	--	--	--	--	--	23.3
2021	--	--	--	--	--	--	23.3
2022	--	--	--	--	--	--	26.6
2023	--	--	--	--	--	--	26.7
2024	--	--	--	--	--	--	0.2
Subtotal	28	--	--	--	--	--	750.7

Annual Funding							
1810 Procurement Other Procurement, Navy							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2010	33	52.9	--	8.7	61.6	--	61.6
2011	54	87.4	--	24.1	111.5	--	111.5
2012	26	56.7	--	50.6	107.3	--	107.3
2013	34	100.3	--	55.9	156.2	--	156.2
2014	41	100.0	--	83.6	183.6	--	183.6
2015	17	88.3	--	144.9	233.2	--	233.2
2016	12	36.5	--	81.6	118.1	--	118.1
2017	2	3.3	--	30.7	34.0	--	34.0
2018	2	12.3	4.2	53.3	69.8	--	69.8
2019	6	35.3	9.1	69.5	113.9	--	113.9
2020	12	54.4	3.3	34.5	92.2	--	92.2
2021	--	--	1.1	20.4	21.5	--	21.5
2022	--	--	--	31.3	31.3	--	31.3
2023	--	--	4.0	15.1	19.1	--	19.1
2024	--	--	14.8	24.8	39.6	--	39.6
2025	--	--	7.6	12.1	19.7	--	19.7
2026	--	--	5.8	7.9	13.7	--	13.7
2027	--	--	5.1	7.1	12.2	--	12.2
2028	--	--	--	6.2	6.2	--	6.2
Subtotal	239	627.4	55.0	762.3	1444.7	--	1444.7

Annual Funding							
1810 Procurement Other Procurement, Navy							
Fiscal Year	Quantity	BY 2002 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2010	33	43.7	--	7.2	50.9	--	50.9
2011	54	71.2	--	19.6	90.8	--	90.8
2012	26	45.5	--	40.6	86.1	--	86.1
2013	34	79.4	--	44.2	123.6	--	123.6
2014	41	78.1	--	65.3	143.4	--	143.4
2015	17	68.1	--	111.6	179.7	--	179.7
2016	12	27.7	--	61.9	89.6	--	89.6
2017	2	2.5	--	22.9	25.4	--	25.4
2018	2	9.0	3.1	39.1	51.2	--	51.2
2019	6	25.4	6.5	50.0	81.9	--	81.9
2020	12	38.4	2.3	24.3	65.0	--	65.0
2021	--	--	0.8	14.1	14.9	--	14.9
2022	--	--	--	21.2	21.2	--	21.2
2023	--	--	2.7	10.0	12.7	--	12.7
2024	--	--	9.6	16.2	25.8	--	25.8
2025	--	--	4.9	7.7	12.6	--	12.6
2026	--	--	3.6	5.0	8.6	--	8.6
2027	--	--	3.1	4.4	7.5	--	7.5
2028	--	--	--	3.7	3.7	--	3.7
Subtotal	239	489.0	36.6	569.0	1094.6	--	1094.6

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	7/21/2003	2/28/2012
Approved Quantity	90	113
Reference	Milestone B Acquisition Strategy	Extended LRIP ADM
Start Year	2010	2010
End Year	2011	2012

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the strong technical performance of NMT during Operational Assessment.

The Total LRIP is also more than 10% in order to ensure a smooth and consistent establishment of production capacity, as well as to take advantage of the significant operational benefits from providing the NMT capability aligned with the satellites with which it operates.

A Gate-6/FRP Decision Review was conducted on November 8, 2012 and approved via an ADM on November 30, 2012. This ADM authorized full production and installation for the NMT Program of Record and Other Customers.

Approved quantity reflects the U.S. Navy fleet modernization buy, and does not include Other Customer Funded quantities.

Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost \$M	Description
Australia	4/30/2017	7	74.3	FMS Case AT-P-LFQ
United Kingdom	4/18/2007	16	96.1	FMS Case UK-P-LTN and UK-P-LVA
Netherlands	7/26/2006	5	37.9	FMS Case NE-P-LGR
Canada	3/30/2006	23	89.0	FMS Case CN-P-LHL

Notes

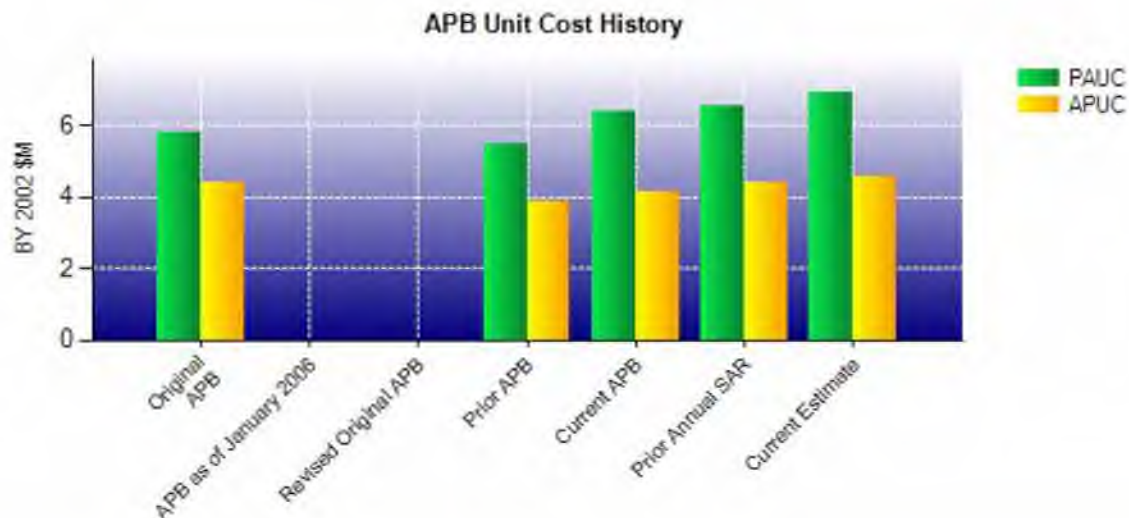
Nuclear Costs

None

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2002 \$M	BY 2002 \$M	% Change
	Current UCR Baseline (Mar 2016 APB)	Current Estimate (Dec 2017 SAR)	
Program Acquisition Unit Cost			
Cost	1771.4	1845.3	
Quantity	278	267	
Unit Cost	6.372	6.911	+8.46
Average Procurement Unit Cost			
Cost	1041.6	1094.6	
Quantity	250	239	
Unit Cost	4.166	4.580	+9.94
Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2002 \$M	BY 2002 \$M	% Change
	Original UCR Baseline (Dec 2006 APB)	Current Estimate (Dec 2017 SAR)	
Program Acquisition Unit Cost			
Cost	1923.4	1845.3	
Quantity	333	267	
Unit Cost	5.776	6.911	+19.65
Average Procurement Unit Cost			
Cost	1345.6	1094.6	
Quantity	305	239	
Unit Cost	4.412	4.580	+3.81

Unit Cost increase from the Current Baseline is due to NMT receiving procurement funds in FY 2018 - 2021 for the fielding of Assured Command and Control (AC2) modems. The modem upgrades improve the AC2 posture and provide Satellite Communications reliability and space resiliency.



APB Unit Cost History					
Item	Date	BY 2002 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Dec 2006	5.776	4.412	6.970	5.544
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	Apr 2013	5.498	3.857	6.823	5.017
Current APB	Mar 2016	6.372	4.166	8.047	5.474
Prior Annual SAR	Dec 2016	6.573	4.389	8.371	5.820
Current Estimate	Dec 2017	6.911	4.580	8.790	6.045

Unit cost increase from the Current Baseline is due to the addition of funding for the fielding of Assured Command and Control modems.

SAR Unit Cost History

Initial SAR Baseline to Current SAR Baseline (TY \$M)									
Initial PAUC Development Estimate	Changes								PAUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
6.970	0.082	0.637	0.034	0.000	-1.210	0.000	-0.418	-0.875	6.095

Current SAR Baseline to Current Estimate (TY \$M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
6.095	-0.011	0.428	0.160	0.776	1.342	0.000	0.000	2.695	8.790

Initial SAR Baseline to Current SAR Baseline (TY \$M)									
Initial APUC Development Estimate	Changes								APUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
5.544	0.047	0.553	0.038	0.000	-1.295	0.000	-0.461	-1.118	4.426

Current SAR Baseline to Current Estimate (TY \$M)									
APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4.426	-0.010	0.219	0.159	0.346	0.905	0.000	0.000	1.619	6.045

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	Oct 2003	Oct 2003	Oct 2003
Milestone C	N/A	Feb 2010	Feb 2010	Aug 2010
IOC	N/A	Sep 2012	Sep 2012	Dec 2012
Total Cost (TY \$M)	N/A	2321.1	1853.0	2347.0
Total Quantity	N/A	333	304	267
PAUC	N/A	6.970	6.095	8.790

Cost Variance

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	631.3	1221.7	--	1853.0
Previous Changes				
Economic	+0.1	+2.9	--	+3.0
Quantity	--	-76.3	--	-76.3
Schedule	+4.8	+40.3	--	+45.1
Engineering	+124.5	+87.4	--	+211.9
Estimating	+111.5	+179.0	--	+290.5
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+240.9	+233.3	--	+474.2
Current Changes				
Economic	-0.6	-5.4	--	-6.0
Quantity	--	-34.9	--	-34.9
Schedule	--	-2.4	--	-2.4
Engineering	--	-4.8	--	-4.8
Estimating	+30.7	+37.2	--	+67.9
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+30.1	-10.3	--	+19.8
Total Changes	+271.0	+223.0	--	+494.0
CE - Cost Variance	902.3	1444.7	--	2347.0
CE - Cost & Funding	902.3	1444.7	--	2347.0

Summary BY 2002 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Production Estimate)	555.9	962.0	--	1517.9
Previous Changes				
Economic	--	--	--	--
Quantity	--	-55.9	--	-55.9
Schedule	+2.8	+18.5	--	+21.3
Engineering	+88.9	+55.2	--	+144.1
Estimating	+82.4	+117.4	--	+199.8
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+174.1	+135.2	--	+309.3
Current Changes				
Economic	--	--	--	--
Quantity	--	-23.4	--	-23.4
Schedule	--	-1.5	--	-1.5
Engineering	--	-3.2	--	-3.2
Estimating	+20.7	+25.5	--	+46.2
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+20.7	-2.6	--	+18.1
Total Changes	+194.8	+132.6	--	+327.4
CE - Cost Variance	750.7	1094.6	--	1845.3
CE - Cost & Funding	750.7	1094.6	--	1845.3

Previous Estimate: December 2016

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.6
Revised estimate for Service-wide adjustments. (Estimating)	-3.8	-5.7
Adjustment for current and prior escalation. (Estimating)	+0.1	+0.1
Revised estimate to reflect Congressional mark for FY 2017 Joint Aerial Layer Network Maritime unjustified growth. (Estimating)	-0.6	-0.9
Revised estimate for Wideband Anti-Jam System development. (Estimating)	+25.0	+37.2
RDT&E Subtotal	+20.7	+30.1

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-5.4
Total Quantity variance resulting from a decrease of 11 terminals from 250 to 239. (Subtotal)	-34.6	-51.5
Quantity variance resulting from a decrease of 11 terminals from 250 to 239. (Quantity)	(-23.4)	(-34.9)
Allocation to Schedule resulting from Quantity change. (Schedule) (QR)	(-1.5)	(-2.2)
Allocation to Engineering resulting from Quantity change. (Engineering) (QR)	(-3.2)	(-4.8)
Allocation to Estimating resulting from Quantity change. (Estimating) (QR)	(-6.5)	(-9.6)
Acceleration of procurement buy profile from FY 2020 to FY 2019 to accelerate FOC. (Schedule)	0.0	-0.2
Revised estimate to support Navy strategy to accelerate FOC. (Estimating)	+30.6	+45.0
Adjustment for current and prior escalation. (Estimating)	+1.4	+1.8
Procurement Subtotal	-2.6	-10.3

(QR) Quantity Related

Contracts

Contract Identification

Appropriation: Procurement
Contract Name: NMT Follow-On Full Deployment
Contractor: Raytheon
Contractor Location: 1001 Boston Post Road
 Marlboro, MA 01752
Contract Number: N00039-16-C-0050/1
Contract Type: Firm Fixed Price (FFP)
Award Date: December 29, 2015
Definitization Date: December 29, 2015

Contract Price

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
203.7	N/A	45	203.7	N/A	45	203.7	203.7

Cost and Schedule Variance Explanations

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

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	28	28	28	100.00%
Production	219	219	239	91.63%
Total Program Quantity Delivered	247	247	267	92.51%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	2347.0	Years Appropriated	18
Expended to Date	1582.4	Percent Years Appropriated	64.29%
Percent Expended	67.42%	Appropriated to Date	1814.6
Total Funding Years	28	Percent Appropriated	77.32%

The above data is current as of February 12, 2018.

Production Deliveries to Date reflect U.S. Navy fleet modernization buys, and do not include Other Customer Funds quantities.

Operating and Support Cost

Cost Estimate Details

Date of Estimate: November 30, 2017
Source of Estimate: POE
Quantity to Sustain: 239
Unit of Measure: System
Service Life per Unit: 23.00 Years
Fiscal Years in Service: FY 2012 - FY 2034

The NMT unit of measure is defined as a single terminal, to include the Communication Group, Antennas, and Radomes. Total O&S reflects the sum of all costs resulting from the operation, maintenance, and support of NMT terminals after acceptance into the Navy Inventory. Efforts include depot maintenance, sustaining support, In Service Engineering Activity, program management, system engineering, system test & evaluation, software maintenance and facilities costs. The 28 RDT&E funded Engineering Development Model assets are not included in the NMT sustainment plan because they are not part of the fielded inventory objective.

Sustainment Strategy

The NMT sustainment strategy includes the maintenance of both the hardware and software. The hardware maintenance employs a three level concept – Organizational, Intermediate, and Depot. The Intermediate maintenance will be performed by the Regional Maintenance Centers and further supported by the In Service Engineering Agent Atlantic and Pacific, and include efforts such as the help desk, Fleet assistance, and life cycle testing. The Depot maintenance includes any repairs to the Antenna Systems (organic) and Communication Group (commercial). The Sparing concept includes both On Board Repair Parts, which support each fielded platform, and Supply System Stock, which are secondary items required for full life cycle support as managed through Naval Supply Systems Command Weapon Systems Support. Additionally, the program will provide major combatants with added allowance items that include parts identified as single points of failure. The Original Equipment Manufacturer is the assigned Software Support Activity. Software Maintenance will include a combination of refresh and maintenance, to include updates, fixes, and patches. The software refreshes will occur approximately every 18 months through the end of the system life.

Antecedent Information

The Navy Extremely High Frequency Satellite Program (NESP) and WSC-6 Super High Frequency (SHF) programs are antecedent programs to NMT, but program costs are not readily available.

Annual O&S Costs BY2002 \$K		
Cost Element	NMT Average Annual Cost Per System	No Antecedent (Antecedent) N/A
Unit-Level Manpower	39.000	0.000
Unit Operations	0.000	0.000
Maintenance	2.000	0.000
Sustaining Support	22.000	0.000
Continuing System Improvements	0.000	0.000
Indirect Support	24.000	0.000
Other	0.000	0.000
Total	87.000	--

Item	Total O&S Cost \$M			
	NMT			No Antecedent (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	253.0	278.3	259.8	N/A
Then Year	377.5	N/A	402.3	N/A

Disposal Cost is included in the Operating and Support Cost of the current APB objective and threshold for this program.

Unit-Level Manpower costs are not included in the NMT APB. For comparison purposes, Unit-Level Manpower costs are excluded from the reported Current Estimate.

Equation to Translate Annual Cost to Total Cost

Total O&S = (Average Annual Cost per System - Unit-Level Manpower Cost) * Total Number of NMT Systems * NMT System Life

$$\$259.8M = (\$86.6K - \$39.4K) * 239 * 23$$

O&S Cost Variance		
Category	BY 2002 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2016 SAR	271.8	
Programmatic/Planning Factors	-12.0	Revised estimate to reflect inventory objective reduction from 250 to 239.
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	-12.0	
Current Estimate	259.8	

Disposal Estimate Details

Date of Estimate: November 30, 2017
Source of Estimate: POE
Disposal/Demilitarization Total Cost (BY 2002 \$M): Total costs for disposal of all System are 0.5

Costs include equipment removal; packaging, handling, storage and distribution; and disposition services.