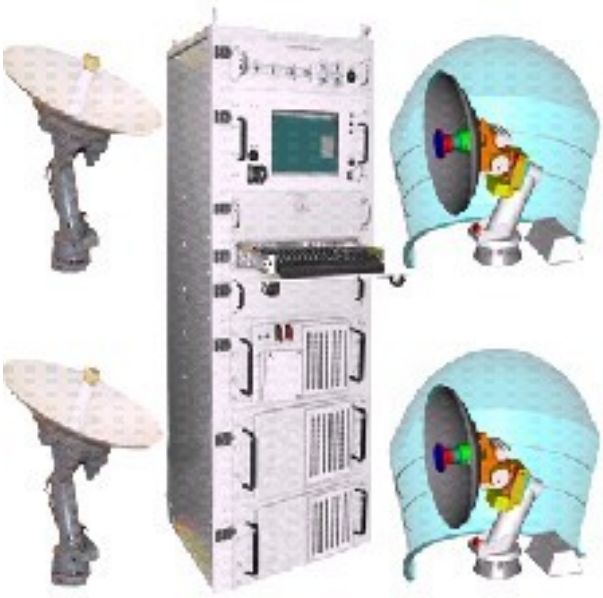
Selected Acquisition Report (SAR)

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



Navy Multiband Terminal (NMT)

As of FY 2017 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

Table of Contents

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

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Date Assigned: September 10, 2013

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), and the NMT CPD (NMT CPD 769-6F-08, November 18, 2008). 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

NMT held a successful Gate 6/Configuration Steering Board (CSB) review on November 30, 2015. The purpose of the review was to add the Wideband Anti-Jam Modem System (WAMS) capability to the NMT program baseline in support of Anti-Access/Area Denial initiatives. The Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN (RDA)) approved WAMS pre-acquisition activities and the program has initiated these efforts in the first quarter of FY 2016.

In support of the Gate 6/CSB and updated APB, the program office worked with the Naval Center for Cost Analysis to develop a revised Component Cost Position (CCP). The CCP was approved on December 18, 2015. The updated APB, which was signed on March 11, 2016, adds Adaptive Coding (AC) and WAMS to the program baseline. AC was approved by ASN (RDA) at the June 2014 CSB and provides the Fleet with optimized communication throughput in dynamic environments.

On December 29, 2015, NMT awarded the Follow-On Full Deployment production contract to Raytheon. The contract, valued at $466M, will allow the program office to procure remaining terminals to meet the inventory objective and will support NMT procurements for Other Customer Funded (OCF) requirements. At the time of the award, the program exercised the Production Year 6 option for a buy of 12 NMT program of record terminals and 21 OCF terminals.

As of December 30, 2015, NMT has fielded 101 of the 250 terminals in the current inventory objective.

NMT continues to prepare for a Follow-on Operational Test and Evaluation, scheduled for the third quarter of FY 2016.

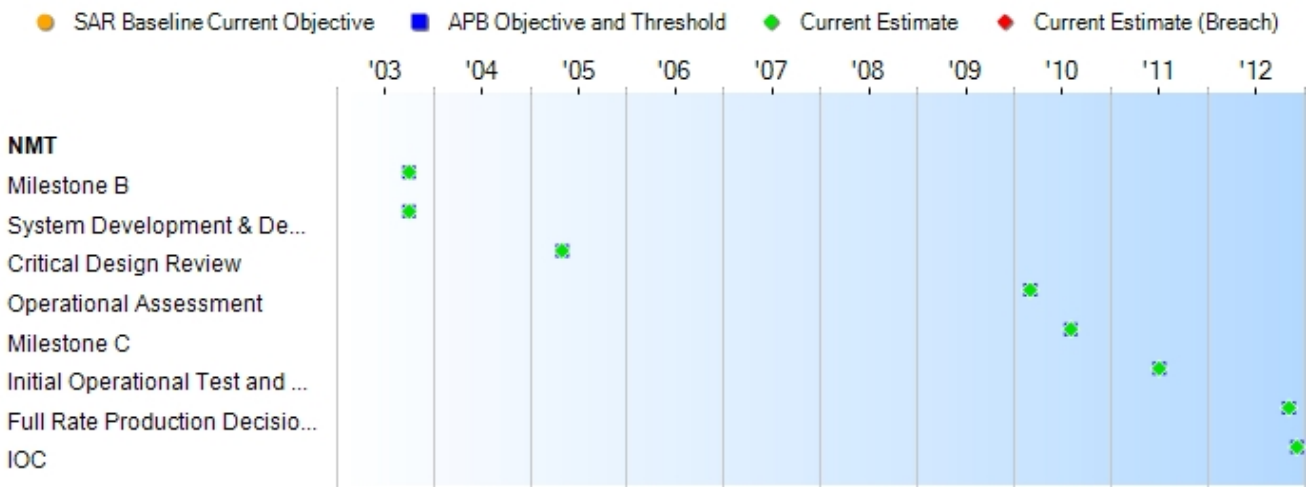
There are no significant software-related issues with this program at this time.

Threshold Breaches

APB Breaches		
Schedule		☐
Performance		☐
Cost	RDT&E	☐
	Procurement	☐
	MILCON	☐
	Acq O&M	☐
O&S Cost		☐
Unit Cost	PAUC	☐
	APUC	☐

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.	Demonstrat-ed 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					
Materiel Availability					
>= 0.95	>= 0.95	>= 0.75	Ship: 0.98, Sub: 0.99, Shore: 0.99	>= 0.95	(Ch-1)
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)	(Ch-1)
Reliability					
Materiel Reliability – Mean Time Between Failure (MTBF)					
>= 2200 hrs	>= 2200 hrs	>= 1100 hrs	Ship: 14,211 hrs, Sub: 9,275 hrs, Shore: >= 2,200 hrs	>= 2200 hrs	(Ch-1)
Materiel Reliability - Mean Time Between Critical Failure (MTBCF)					
>= 4200 hrs	>= 4200 hrs	>= 1400 hrs	Ship: 14,211 hrs, Sub: 9,275 hrs, Shore: >= 4,200 hrs	>= 4200 hrs	(Ch-1)
Maintainability					
Mean Time to Repair (MTTR)					
<= 1 hr	<= 1 hr	<= 3 hrs	Ship: 1.18 hrs	<= 1 hr	

			(10/15/2012) Shore: 1.25 hrs (11/14/2011) Sub: 4.3 hrs (11/14/2011)		
Cost					
Ownership Cost					
<= $298M	<= $253M	<= $278M	$253.0M	<= $328M	(Ch-2)
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) simultan-eously. The NMT shall operate in the EHF/AEHF LDR, MDR, and XDR communica-tion modes.	NMT shall provide AEHF/EHF capability with two-way military Ka-band (ship only), GBS (sub/ship) and X-band (ship /subs) simultan-eously. The NMT shall operate in the EHF/AEHF LDR, MDR, and XDR communica-tion 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 communica-tion modes.	TBD	NMT shall provide AEHF/EHF capability with two-way military Ka-band (ship only), GBS (sub/ship) and X-band (ship /subs) simultaneou-sly. The NMT shall operate in the EHF/AEHF LDR, MDR, and XDR communicat-ion 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 transition to Net-Centric military operations to include: 1) DISR mandated GIG IT standards and profiles identified in	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 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 requirements for Net-Centric military operations to include: 1) DISR mandated GIG IT standards and profiles identified in	Interoperabil-ity: NMT is capable of supporting operations in the joint operations environment. The NMT interfaced and operated with other communicat-ions systems over Milstar, WGS, and DSCS satellite systems. The NMTs conducted end-to-end communicat-ions with other NMTs and legacy EHF and SHF terminals. During testing and ongoing operations,	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.	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.	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.	the Navy sent a large number of e-mails through the Secure Internet Protocol Router Network (SIPRNET) as their preferred mode of communicat-ions. Information Assurance: The Navy Information Operations Command performed information assurance testing during the integrated test period.	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.	
Sustainment - WAMS					
Materiel Availability - WAM					
N/A	>= 0.75	(T=O) >= 0.75	TBD	>= 0.75	(Ch-3)
Materiel Availability - Mini-Hub					
N/A	>= 0.75	(T=O) >= 0.75	TBD	>= 0.75	(Ch-3)
Ao - WAM					
N/A	>= 0.96	(T=O) >= 0.96	TBD	>= 0.96	(Ch-3)
Ao - Mini-Hub					
N/A	>= 0.96	(T=O) >= 0.96	TBD	>= 0.96	(Ch-3)
Reliability					
MTBF - WAM					
N/A	>= 30,000 hrs	(T=O) >= 30,000 hrs	TBD	>= 30,000 hrs	(Ch-3)
MTBF - Mini-Hub					
N/A	>= 8,900 hrs	(T=O) >= 8,900 hrs	TBD	>= 8,900 hrs	(Ch-3)
Maintainability					
MTTR - WAM					
N/A	< 1 hour	(T=O) < 1 hour	TBD	< 1 hour	(Ch-3)
MTTR - Mini-Hub					
N/A	< 1 hour	(T=O) < 1 hour	TBD	< 1 hour	(Ch-3)

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)	(Ch-3)
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)	(Ch-3)
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)	(Ch-3)

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) Demonstrated Performance metrics for Material Availability, Operational Availability, MTBF, and MTBCF on Ship/Sub platforms reflect Naval Sea Warfare Center Corona data as of December 31, 2015; Shore metrics reflect data provided by the vendor.
(Ch-2) Cost estimate changed from $223.5M to $253.0M to reflect the December 18, 2015 Component Cost Position.
(Ch-3) Performance Characteristic was added in the NMT CPD Increment 1 for WAMS.

Notes

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

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
WGS - Wideband Global SATCOM
XDR - Extended Data Rate

Track to Budget

RDT&E

Appn		BA	PE
Navy	1319	07	0303109N

Project	Name	
0728	Navy Multiband Terminal	(Shared)
9889	Navy Multiband Terminal	(Shared) (Sunk)

Procurement

Appn		BA	PE
Navy	1810	02	0303109N

Line Item	Name
3216	Navy Multiband Terminal

Notes

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	Current Estimate
RDT&E	555.9	729.8	802.8	728.1	631.3	868.6	868.6
Procurement	962.0	1041.6	1145.8	1039.5	1221.7	1368.4	1368.4
Flyaway	--	--	--	1039.5	--	--	1368.4
Recurring	--	--	--	539.2	--	--	703.3
Non Recurring	--	--	--	500.3	--	--	665.1
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	1517.9	1771.4	N/A	1767.6	1853.0	2237.0	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

Confidence Level

Confidence Level of cost estimate for current APB: 53%

The estimate was developed at the Risk Adjusted Mean.

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

Quantity Notes

The original NMT inventory objective was 276 but the quantity has been reduced to 250 due to revised Navy requirements.

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

Procurement costs in FY 2023 - 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.

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2017 President's Budget / December 2015 SAR (TY$ M)									
Appropriation	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
RDT&E	671.6	28.0	21.1	32.1	34.8	30.8	10.3	39.9	868.6
Procurement	853.4	118.1	38.4	68.1	95.0	71.4	11.1	112.9	1368.4
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 2017 Total	1525.0	146.1	59.5	100.2	129.8	102.2	21.4	152.8	2237.0
PB 2016 Total	1546.0	144.1	70.0	69.1	88.6	76.9	42.8	23.6	2061.1
Delta	-21.0	2.0	-10.5	31.1	41.2	25.3	-21.4	129.2	175.9

Quantity Summary										
FY 2017 President's Budget / December 2015 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	To Complete	Total
Development	28	0	0	0	0	0	0	0	0	28
Production	0	205	12	2	8	10	13	0	0	250
PB 2017 Total	28	205	12	2	8	10	13	0	0	278
PB 2016 Total	28	205	12	3	3	17	6	4	0	278
Delta	0	0	0	-1	5	-7	7	-4	0	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
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	--	--	--	--	--	--	28.0
2017	--	--	--	--	--	--	21.1
2018	--	--	--	--	--	--	32.1
2019	--	--	--	--	--	--	34.8
2020	--	--	--	--	--	--	30.8
2021	--	--	--	--	--	--	10.3
2022	--	--	--	--	--	--	9.0
2023	--	--	--	--	--	--	16.2
2024	--	--	--	--	--	--	14.7
Subtotal	28	--	--	--	--	--	868.6

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	--	--	--	--	--	--	21.4
2017	--	--	--	--	--	--	15.8
2018	--	--	--	--	--	--	23.6
2019	--	--	--	--	--	--	25.1
2020	--	--	--	--	--	--	21.8
2021	--	--	--	--	--	--	7.1
2022	--	--	--	--	--	--	6.1
2023	--	--	--	--	--	--	10.8
2024	--	--	--	--	--	--	9.6
Subtotal	28	--	--	--	--	--	728.1

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	48.2	--	69.9	118.1	--	118.1
2017	2	3.5	--	34.9	38.4	--	38.4
2018	8	23.3	--	44.8	68.1	--	68.1
2019	10	55.2	--	39.8	95.0	--	95.0
2020	13	35.2	--	36.2	71.4	--	71.4
2021	--	--	--	11.1	11.1	--	11.1
2022	--	--	--	25.5	25.5	--	25.5
2023	--	12.1	--	2.3	14.4	--	14.4
2024	--	11.2	--	9.5	20.7	--	20.7
2025	--	10.2	--	7.2	17.4	--	17.4
2026	--	8.4	--	6.3	14.7	--	14.7
2027	--	7.6	--	5.1	12.7	--	12.7
2028	--	2.8	--	4.7	7.5	--	7.5
Subtotal	250	703.3	--	665.1	1368.4	--	1368.4

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	--	40.5	86.0	--	86.0
2013	34	79.3	--	44.3	123.6	--	123.6
2014	41	78.1	--	65.2	143.3	--	143.3
2015	17	68.0	--	111.5	179.5	--	179.5
2016	12	36.5	--	52.9	89.4	--	89.4
2017	2	2.6	--	25.9	28.5	--	28.5
2018	8	17.0	--	32.6	49.6	--	49.6
2019	10	39.4	--	28.5	67.9	--	67.9
2020	13	24.7	--	25.3	50.0	--	50.0
2021	--	--	--	7.6	7.6	--	7.6
2022	--	--	--	17.2	17.2	--	17.2
2023	--	8.0	--	1.5	9.5	--	9.5
2024	--	7.2	--	6.2	13.4	--	13.4
2025	--	6.5	--	4.5	11.0	--	11.0
2026	--	5.2	--	3.9	9.1	--	9.1
2027	--	4.6	--	3.1	7.7	--	7.7
2028	--	1.7	--	2.8	4.5	--	4.5
Subtotal	250	539.2	--	500.3	1039.5	--	1039.5

Cost Quantity Information 1810 | Procurement | Other Procurement, Navy		
Fiscal Year	**Quantity**	**End Item Recurring Flyaway (Aligned With Quantity) BY 2002 $M**
2010	33	47.7
2011	54	74.2
2012	26	48.5
2013	34	82.5
2014	41	80.1
2015	17	72.0
2016	12	38.5
2017	2	5.6
2018	8	19.0
2019	10	43.4
2020	13	27.7
2021	--	--
2022	--	--
2023	--	--
2024	--	--
2025	--	--
2026	--	--
2027	--	--
2028	--	--
Subtotal	250	539.2

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
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

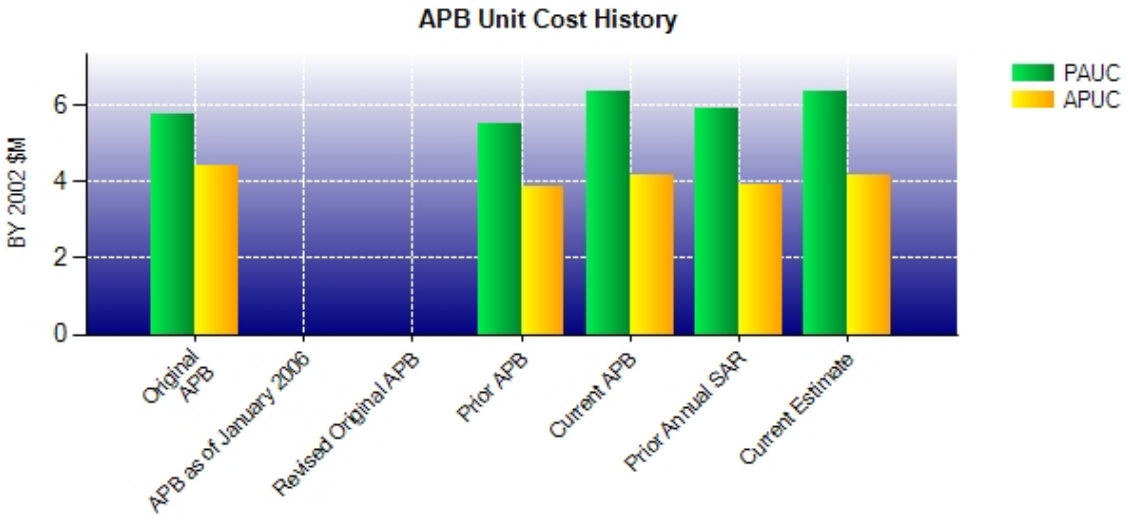
Unit Cost

Unit Cost Report

Item	BY 2002 $M Current UCR Baseline (Mar 2016 APB)	BY 2002 $M Current Estimate (Dec 2015 SAR)	% Change
Program Acquisition Unit Cost			
Cost	1771.4	1767.6	
Quantity	278	278	
Unit Cost	6.372	6.358	-0.22
Average Procurement Unit Cost			
Cost	1041.6	1039.5	
Quantity	250	250	
Unit Cost	4.166	4.158	-0.19

Item	BY 2002 $M Original UCR Baseline (Dec 2006 APB)	BY 2002 $M Current Estimate (Dec 2015 SAR)	% Change
Program Acquisition Unit Cost			
Cost	1923.4	1767.6	
Quantity	333	278	
Unit Cost	5.776	6.358	+10.08
Average Procurement Unit Cost			
Cost	1345.6	1039.5	
Quantity	305	250	
Unit Cost	4.412	4.158	-5.76

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 2014	5.924	3.910	7.414	5.108
Current Estimate	Dec 2015	6.358	4.158	8.047	5.474

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	0.008	0.297	0.033	0.762	0.852	0.000	0.000	1.952	8.047

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	0.009	0.156	0.037	0.350	0.496	0.000	0.000	1.048	5.474

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	2237.0
Total Quantity	N/A	333	304	278
PAUC	N/A	6.970	6.095	8.047

Cost Variance

Summary TY $M				
Item	**RDT&E**	**Procurement**	**MILCON**	**Total**
SAR Baseline (Production Estimate)	631.3	1221.7	--	1853.0
Previous Changes				
Economic	+0.7	+7.9	--	+8.6
Quantity	--	-76.3	--	-76.3
Schedule	--	+9.6	--	+9.6
Engineering	--	--	--	--
Estimating	+152.1	+114.1	--	+266.2
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+152.8	+55.3	--	+208.1
Current Changes				
Economic	-0.7	-5.6	--	-6.3
Quantity	--	--	--	--
Schedule	--	-0.3	--	-0.3
Engineering	+124.5	+87.4	--	+211.9
Estimating	-39.3	+9.9	--	-29.4
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+84.5	+91.4	--	+175.9
Total Changes	+237.3	+146.7	--	+384.0
CE - Cost Variance	868.6	1368.4	--	2237.0
CE - Cost & Funding	868.6	1368.4	--	2237.0

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	--	-0.7	--	-0.7
Engineering	--	--	--	--
Estimating	+113.3	+72.2	--	+185.5
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+113.3	+15.6	--	+128.9
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	+88.9	+55.2	--	+144.1
Estimating	-30.0	+6.7	--	-23.3
Other	--	--	--	--
Support	--	--	--	--
Subtotal	+58.9	+61.9	--	+120.8
Total Changes	+172.2	+77.5	--	+249.7
CE - Cost Variance	728.1	1039.5	--	1767.6
CE - Cost & Funding	728.1	1039.5	--	1767.6

Previous Estimate: December 2014

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-0.7
Revised estimate to reflect the addition of the Wideband Anti-Jam Modem System (WAMS). (Engineering)	+88.9	+124.5
Revised estimate to reflect cost estimating methodology changes to align with the updated SCP. (Estimating)	-17.2	-22.5
Revised estimate due to funding reductions, such as the RDT&E Underexecution Mark, and WAMS IOC rephasing. (Estimating)	-13.2	-17.3
Adjustment for current and prior escalation. (Estimating)	+0.4	+0.5
RDT&E Subtotal	+58.9	+84.5

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-5.6
Acceleration of procurement buy profile caused by FY 2018 - FY 2020 Other Procurement, Navy (OPN) funding realignments. (Schedule)	0.0	-0.3
Revised estimate to reflect the addition of the Wideband Anti-Jam Modem System. (Engineering)	+55.2	+87.4
Revised estimate to reflect cost estimating methodology changes to align with the updated SCP. (Estimating)	+2.8	+4.3
Revised estimate due to funding reductions, such as the OPN Underexecution Mark, and WAMS IOC rephasing. (Estimating)	+1.2	+2.1
Adjustment for current and prior escalation. (Estimating)	+2.7	+3.5
Procurement Subtotal	+61.9	+91.4

Contracts

Contract Identification

Appropriation: Procurement
Contract Name: NMT Production & Deployment
Contractor: Raytheon
Contractor Location: 1001 Boston Post Road
Marlboro, MA 01752
Contract Number: N00039-04-C-0012/3
Contract Type: Firm Fixed Price (FFP)
Award Date: September 07, 2010
Definitization Date: September 07, 2010

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
641.5	N/A	276	394.2	N/A	205	394.2	394.2

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to a reduction in inventory objective and the extension of the NMT fielding plan, both of which reduced the number of terminals procured on the contract. In response to a change in Navy requirements, the inventory objective was reduced from 276 to 250. Furthermore, fact of life changes such as funding reductions have moved the procurement of 45 terminals onto the Follow-On Full Deployment contract, which was awarded December 29, 2015.

Cost and Schedule Variance Explanations

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

Notes

This contract is more than 90% complete; therefore, this is the final report for this contract.

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.

Notes

This is the first time this contract is being reported.

Deliveries and Expenditures

Deliveries				
Delivered to Date	**Planned to Date**	**Actual to Date**	**Total Quantity**	**Percent Delivered**
Development	28	28	28	100.00%
Production	179	172	250	68.80%
Total Program Quantity Delivered	207	200	278	71.94%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	2237.0	Years Appropriated	16
Expended to Date	1240.1	Percent Years Appropriated	57.14%
Percent Expended	55.44%	Appropriated to Date	1671.1
Total Funding Years	28	Percent Appropriated	74.70%

The above data is current as of February 09, 2016.

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: December 18, 2015
Source of Estimate: SCP
Quantity to Sustain: 250
Unit of Measure: System
Service Life per Unit: 21.00 Years
Fiscal Years in Service: FY 2012 - FY 2032

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	39.400	0.000
Unit Operations	0.000	0.000
Maintenance	2.300	0.000
Sustaining Support	21.900	0.000
Continuing System Improvements	0.000	0.000
Indirect Support	24.000	0.000
Other	0.000	0.000
Total	87.600	--

Item	Total O&S Cost $M			
	NMT			No Antecedent (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	253.0	278.3	253.0	N/A
Then Year	377.5	N/A	377.5	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 nor in the 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

$253.0M = ($87.6K - $39.4K) * 250 * 21

O&S Cost Variance		
Category	**BY 2002 $M**	**Change Explanations**
Prior SAR Total O&S Estimates - Dec 2014 SAR	169.3	
Programmatic/Planning Factors	25.3	Revised estimate to reflect the addition of the Wideband Anti-Jam Modem System.
Cost Estimating Methodology	58.4	Revised estimate to reflect cost estimating methodology changes in the updated SCP. Changes include revised Cost Estimating Relationships and underlying assumptions used to estimate Software Maintenance costs as well as the addition of code maintenance associated with Adaptive Coding (AC) and Advanced Time Division Multiple Access Interface Processor (ATIP). AC and ATIP were not included in the previous estimate.
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	83.7	
Current Estimate	253.0	

Disposal Estimate Details

Date of Estimate: December 18, 2015

Source of Estimate: SCP

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.