

By kempr on May 02, 2022

Department of Defense
OFFICE OF PREPUBLICATION AND SECURITY REVIEW



DDG 51 ARLEIGH BURKE CLASS GUIDED MISSILE DESTROYER (DDG 51)

December 2021 Selected Acquisition Report (SAR)



DECEMBER 31, 2021
DEPARTMENT OF THE NAVY

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Common Acronyms and Abbreviations

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
CCP - Component Cost Position
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
FLT - Flight
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

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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(A&S) - Under Secretary of Defense (Acquisition and Sustainment)

USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)

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Program Manager

Name: CAPT Seth A. Miller, USN

Date Assigned: April 15, 2019

Address:

Program Executive Office Ships (PEO Ships)

1333 Isaac Hull Avenue SE

Washington, DC 20376-2301

Phone: 202-781-2177

Email: seth.a.miller20.mil@us.navy.mil

Mission and Description

The DDG 51 Arleigh Burke Class Guided Missile Destroyer (DDG 51) is a multi-mission guided missile destroyer designed to operate offensively and defensively, independently, or as units of Carrier Strike Groups, Expeditionary Strike Groups, and Surface Action Groups in multi-threat environments that include air, surface, and subsurface threats. These ships will respond to Low Intensity Conflict/Coastal and Littoral Offshore Warfare scenarios as well as open ocean conflict providing or augmenting power projection, forward presence requirements, and escort operations at sea.

The DDG 51 Class comprises four separate variants or "Flights." DDGs 51–71 represent the original design and are designated as Flight I ships, whereas DDGs 72–78 are designated as Flight II ships and include capability upgrades such as the Joint Tactical Information Distribution System (JTIDS) Command and Control Processor, Combat Direction Finding, the Tactical Information Exchange System (TADIX B), SLQ-32(V)3, and the capability to launch and control the SM-2 Block IV Extended Range Missile. Beginning with DDG 79, Flight IIA ships introduced new capabilities including Cooperative Engagement Capability (CEC) and a MK-45 Gun providing improved air and anti-missile defense and land attack. Flight III upgrades will be incorporated on DDG 125, 126, 128 and follow ships. Flight III is centered on the Air and Missile Defense Radar (AMDR) AN/SPY-6(V)1 that enables Flight III ships to simultaneously perform Anti-Air Warfare (AAW) and Ballistic Missile Defense (BMD), which satisfies the Navy's critical need for an enhanced surface combatant Integrated Air and Missile Defense (IAMD) capability. The DDG 51 Class ships provide outstanding combat capability and survivability characteristics while considering procurement and lifetime support costs. They feature extraordinary seakeeping and low observability characteristics. The DDG 51 features the AEGIS Weapon System (AWS), which has quick reaction time, high firepower, and improved Electronic Countermeasures capability in Anti-Air Warfare (AAW). The ships' Anti-Submarine Warfare (ASW) System provides superior long range multi-target detection and engagement capability with two embarked Light Airborne MultiPurpose System MK-III helicopters (DDG 79 and follow-on ships). The Advanced Tomahawk Weapon Control System (DDGs 79-95) and the Tactical Tomahawk Weapons Control System (DDG 96 and follow-on ships) allow employment of multiple variants of Tomahawk missiles for strike warfare. The MK-45 gun weapon system provides significant capability for surface warfare, land attack, and air defense. The CEC is being installed on DDG 51 Class Ships to promote Network Centric Warfare capability. The AWS is the heart of an integrated combat system that provides area coverage and command/control focus in all dimensions of Naval Warfighting and Joint Military Operations: AAW; ASW; Anti-Surface Warfare; Command, Control, Communications, Computers & Intelligence; and Strike Warfare. DDG 113 and follow ships will provide IAMD and work with other BMD assets.

The AWS for Flight III comprises the AN/SPY-6(V)1 radar system, Command and Decision System MK 2, Weapons Control System MK 7, Missile Fire Control System MK 99, Operational Readiness and Test System MK 9, AEGIS Display System MK 2, AEGIS Computer Programs, Advanced Training Domain, and Logistic Support System.

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Executive Summary

Program Highlights Since Last Report-

The DDG 51 Program has successfully delivered 70 ships since program inception in 1985. The program is currently in serial production with 12 ships under construction and a total of 19 under contract at two current DDG 51 class shipbuilders, Huntington Ingalls Industries – Ingalls Shipbuilding (HII Ingalls) and General Dynamics - Bath Iron Works (GD BIW), as of this report date.

The Navy continues to manage costs associated with DDG 51 Class ships with the use of competitive contracts in lieu of sole source contracts. Other cost savings initiatives include the use of competitive Multi-Year Procurement (MYP) contracts with Economic Order Quantity savings and leveraging Government Furnished Equipment (GFE) contracts across multiple ship classes to obtain better prices across the Navy.

The Navy is currently procuring Flight III ships which will provide enhanced surface combatant Integrated Air Missile Defense (IAMD) capability. The Flight III baseline, which begins with DDGs 125-126 (FY 2017 hulls), consists of the integration of the AN/SPY-6(V)1 radar along with upgrades to the electrical power and cooling capacity plus additional associated changes. The first Flight III ship, DDG 125, is on track to deliver in 2023, with IOC in 2024.

The Navy awarded two contracts for the DDG 51 FY 2018 - 2022 MYP for a total of 10 Flight III destroyers on September 27, 2018. Two option ships were subsequently awarded on December 21, 2018 and June 29, 2020. The MYP continues the procurement for the proven DDG 51 Class shipbuilding program, leveraging competition, a strong industrial base, and a stable design in order to achieve savings.

The FY 2021 Consolidated Appropriations Bill reduced the DDG 51 Shipbuilding and Conversion, Navy (SCN) FY 2021 budget request by \$35.4 million for available prior year funds. The bill added \$215 million in SCN for Surface Combatant Shipyard Infrastructure and \$130 million in FY 2021 Advance Procurement for long lead time material for a third DDG 51 ship in FY 2022. Congress also rescinded \$66.6 million in FY 2014 SCN funding.

The FY 2022 Consolidated Appropriations Act fully funded two FY22 ships. The act provided a program increase of \$120M in AP.

The PB 2023 budget requests full funding (\$4417.5 million) for two ships in FY 2023.

The DDG 51 Class Program has achieved the following significant production milestones since the last report:

- DDG 118 Builder's Trials completed December 2020
- DDG 118 Acceptance Trials completed February 2021
- DDG 118 Delivered March 2021
- DDG 118 Sailed away October 2021
- DDG 118 Commissioned December 2021
- DDG 119 Builder's Trials completed February 2020
- DDG 119 Acceptance Trials completed March 2020
- DDG 119 Delivered April 2020
- DDG 119 Commissioned September 2020
- DDG 119 Final Contract Trial completed March 2021
- DDG 120 completed Aegis Light Off June 2021
- DDG 121 Builder's Trials completed August 2021
- DDG 121 Acceptance Trials completed September 2021
- DDG 121 Delivered November 2021

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- DDG 122 Lay Keel February 2020
- DDG 123 Christened April 2021
- DDG 123 completed Aegis Light Off July 2021
- DDG 124 Lay Keel Ceremony April 2021
- DDG 124 Lay Keel May 2021
- DDG 125 Launched June 2021
- DDG 125 Christened March 2022
- DDG 126 Start of Fabrication March 2020
- DDG 127 Lay Keel March 2022
- DDG 128 Start of Fabrication April 2020
- DDG 128 Lay Keel June 2021
- DDG 129 Start of Fabrication January 2021
- DDG 130 Start of Fabrication December 2020
- DDG 131 Start Fabrication December 2021
- DDG 132 Start of Fabrication November 2021

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
May 1978	The Chief of Naval Operations (CNO) initiated DDGX Study Group to establish therequirements for the next generation of surface combatants.
October 1979	DDGX Project Office (93X) established in Naval Sea Systems Command (NAVSEA).
February 1980	Surface Force Level-CNO Executive Board (CEB) promulgated.
February 1980	Surface Combatant CEB Decision Memorandum (Milestone 0).
June 1981	Department of the Navy Systems Acquisition Review Council (DNSARC) reviewed the DDGXProgram.
September 1981	Requirement for a DSARC at Milestone I waived by the Secretary of Defense (SECDEF).
December 1981	DDGX re-designated DDG 51.
May 1982	DDG 51 Project Office was transferred from the Surface Ship Warfare Directorate (SEA 93X)into the AEGIS Shipbuilding Project Office as the Destroyer Division (PMS 400D).
November 1982	Secretary of the Navy (SECNAV) named DDG 51 "ARLEIGH BURKE".
December 1982	Preliminary Design completed.
May 1983	Contract Design initiated to support competitive selection of the lead shipbuilder in early FY1985.
December 1983	SECDEF Decision Memorandum authorized Program to proceed (Milestone II).
December 1984	SECDEF approved DDG 51 Acquisition Strategy for Flight I as part of the Program'sMilestone II decision.
April 1985	Lead ship (DDG 51) contract awarded to Bath Iron Works Corporation (BIW).

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1st Quarter FY 1986	Ships Characteristics Improvement Board (SCIB) approved the first upgrade to the DDG 51 Class ship configuration, designated Flight II, and implemented in the last ship in FY 1992.
October 1986	Approval of Milestone IIIA and Approval for Limited Production (ALP) for FY 1987 through FY 1989 (for three FY 1987 ships, three FY 1988, three 1989, and advance procurement of longlead material for three FY 1990 ships) granted by Assistant Secretary of the Navy for Shipbuilding and Logistics (ASN (S&L)) Program Decision Memorandum.
May 1987	Follow ship (DDG 52) awarded to Ingalls Shipbuilding, Incorporated.
February 1988	DDG 51 Class APB approved.
August 1989	ALP extended for DDG 51 Class ships and systems for which funds were appropriated through FY 1990, and long lead material for FY 1991 ships and systems by ASN (S&L) Program Decision Memorandum.
August 1990	SECDEF Major Warship Review (MWR) decision approved procurement of four DDG 51 Class ships per year starting in FY 1991.
January 1991	Continued production of the DDG 51 Class ships through FY 1991 approved by the Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN (RD&A)) Program Decision Memorandum.
April 1991	Lead ship (DDG 51) delivered to Navy.
1st Quarter FY 1992	Upgrade for Flight II was introduced into DDG 72 in FY 1992 and was awarded to BIW as the lead yard.
April 1992	Continued production of the DDG 51 Class ships through FY 1992 approved by ASN (RD&A) Program Decision Memorandum.
July 1992	The Deputy Under Secretary of Defense (Acquisition) Memorandum established the DDG 51 Class Flight IIA variant as an ACAT ID program.
October 1992	DDG 52 delivered to Navy.
January 1993	Continued production of the DDG 51 Class ships and AN/SPY-1D radar system through FY 1993 approved by ASN (RD&A) Program Decision Memorandum.
February 1993	Initial Operating Capability achieved.
February 1994	DDG 51 Class Acquisition Strategy, Revision 1, was approved by Under Secretary of Defense for Acquisition and Technology (USD (A&T)) as part of the part of the Defense Acquisition Board's (DAB) Milestone IV Program Review prior to implementing Flight IIA.
April 1994	DDG Flight IIA ORD, Revision 1, Serial No. 336(1)-86-94.
July 1994	Flight IIA design awarded to BIW as lead yard for DDG 79.
July 1995	USD (A&T) re-designated the DDG 51 Ship Acquisition Program as an ACAT IC program.
March 1998	FY 1998 - FY 2001 Multi-Year Procurement (MYP) contracts awarded to BIW and Ingalls Shipbuilding.
April 2001	DDG 51 FY 2002 - FY 2004 MYP Acquisition Plan approved.
September 2002	FY 2002 - FY 2005 MYP contracts awarded to BIW and Ingalls Shipbuilding.
August 2005	DDG Flight IIA ORD, Revision 1 Serial No. 336(1)-86-94, Amended by Vice Chief of Naval Operations (VCNO) ltr Ser No. N09/484.
4th Quarter FY 2008	Navy announced decision to truncate the DDG 1000 Program at three ships and to continue production of the DDG 51 Class Program based on the changed threat assessment.

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January 2009	USD (AT&L) Memorandum directed re-start of DDG 51 production through FY 2011, with an increase from 62 to 65 ships.
June 2009	DDG 51 Class Acquisition Strategy, Revision 2, approved by ASN (RD&A) reflecting continuing production of the DDG 51 Program and procurement of three additional ships (one in FY 2010 and two in FY 2011).
June 2011	First FY 2010 restart ship, DDG 113, awarded to Huntington Ingalls Industries (HII - formerly Ingalls Shipbuilding).
September 2011	DDG 51 Program Acquisition Strategy, Revision 2 with Addendum to reflect one ship in FY 2012, was approved by the Undersecretary of Defense for Acquisition, Technology and Logistics (USD (AT&L)).
September 2011	FY 2011 ships awarded to BIW and HII (one each). DDG 115 is first restart ship at BIW.
June 2012	DDG 51 Program Acquisition Strategy updated to reflect FY 2013 – FY 2017 MYP approved by USD (AT&L) to include introduction of Flight III in FY 2016 and FY 2017.
July 2012	USD (AT&L) established as Milestone Decision Authority for DDG 51 as an ACAT ID program.
June 2013	FY 2013 - FY 2017 MYP contracts awarded to BIW and HII.
May 2014	DDG 51 Class Acquisition Strategy Addendum for Air and Missile Defense Radar Incorporation (Flight III) approved.
October 2014	DDG 51 Flight III Capabilities Development Document validated by the JROC.
November 2016	DDG 51 Flight III Critical Design Review completed.
December 2016	First restart ship at HII, DDG 113, delivered to Navy.
February 2017	First restart ship at BIW, DDG 115, delivered to Navy.
June 2017	USD (AT&L) approves production of DDG 51 Flight III design and authorizes award of contracts for the first DDG 51 Flight III ships.
June 2017	HII awarded Flight III Engineering Change Proposal (ECP) for DDG 125 (FY 2017 ship).
August 2017	Acquisition Program Baseline update to reflect Flight III ships approved by USD (AT&L).
September 2017	Acquisition Strategy Third Addendum for procurement of one FY 2016 Flight IIA Ship approved by USD (AT&L).
September 2017	BIW awarded Flight III ECP ship for DDG 126 (FY 2017 ship) and a construction contract for the congressionally-added third FY 2016 ship, DDG 127, as a Flight IIA.
January 2018	USD (AT&L) redesignated the DDG 51 Ship Acquisition Program as an ACAT IC program.
February 2018	Acquisition Strategy update reflecting FY 2018 - FY 2022 MYP signed.
May 2018	First Flight III (DDG 125) started fabrication.
September 2018	FY 2018 – FY 2022 MYP contracts awarded to BIW and HII.
December 2018	FY 2019 Option Ship awarded to BIW.
June 2020	FY 2020 Option Ship awarded to HII

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Schedule

Schedule Events

Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate
Complete Concept Design	N/A	Dec 1980	Jun 1981	Dec 1980
DNSARC I	Jun 1981	Jun 1981	Dec 1981	Jun 1981
Complete Preliminary Design	N/A	Mar 1983	Sep 1983	Mar 1983
DSARC II	Dec 1983	Dec 1983	Jun 1984	Dec 1983
Complete Contract Design	N/A	Jun 1984	Dec 1984	Jun 1984
DDG 51 Contract Award	Apr 1985	Apr 1985	Oct 1985	Apr 1985
Milestone IIIA	Oct 1986	Oct 1986	Apr 1987	Oct 1986
DDG 52 Contract Award	Jan 1987	May 1987	Nov 1987	May 1987
DDG 53 Contract Award	N/A	Sep 1987	Mar 1988	Sep 1987
Lay Keel DDG 51	N/A	Dec 1988	Jun 1989	Dec 1988
Launch DDG 51	N/A	Sep 1989	Mar 1990	Sep 1989
DDG 51 Delivery	N/A	Apr 1991	Oct 1991	Apr 1991
Launch DDG 52	N/A	Mar 1991	Sep 1991	May 1991
Organic Support Available	N/A	Jul 1991	Jan 1992	Jul 1991
Depot Support Available	N/A	Jul 1991	Jan 1992	Jul 1991
OPEVAL	N/A	Feb 1992	Aug 1992	Feb 1992
DDG 52 Delivery	N/A	May 1992	Nov 1992	Oct 1992
DDG 51 IOC	Oct 1990	Feb 1993	Aug 1993	Feb 1993
DDG 53 Delivery	N/A	Feb 1993	Aug 1993	Aug 1993
Milestone IV	N/A	Apr 1993	Oct 1993	Oct 1993
DDG 51 Flight IIA Contract Award	N/A	Mar 1994	Sep 1994	Jul 1994
Complete ESSM COEA	N/A	Nov 1994	May 1995	Nov 1994
ESSM Milestone IV	N/A	Nov 1994	May 1995	Nov 1994
SH-60B Hellfire IOC	N/A	Dec 1997	Jan 1999	Dec 1997
DDG 51 Flight IIA Delivery	N/A	May 2000	Nov 2000	May 2000
DDG 51 Flight IIA IOC	N/A	Oct 2001	Apr 2002	Oct 2001
ESSM IOC	N/A	Jan 2004	Jul 2004	Feb 2004
DDG 51 Flight III Detail Design Contract Award	N/A	Feb 2015	Feb 2015	Feb 2015
DDG 51 Flight III Preliminary Design Review	N/A	Sep 2015	Sep 2015	Sep 2015
DDG 51 Flight III Critical Design Review	N/A	Nov 2016	Nov 2016	Nov 2016

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DDG 51 Flight III Engineering Change Proposal Contract Award	N/A	Jun 2017	Dec 2017	Jun 2017
DDG 51 Flight III Delivery	N/A	Apr 2023	Oct 2023	Apr 2023
DDG 51 Flight III IOC	N/A	Feb 2024	Aug 2024	Aug 2024

Schedule Notes:

Planned Delivery Dates / Obligation Work Limiting Date for DDG 51 Ships

DDG 120: September 2022 / December 2023

DDG 121: November 2021 / March 2023

DDG 122: August 2023 / November 2024

DDG 123: August 2022 / November 2023

DDG 124: April 2024 / July 2025

DDG 127: November 2024 / February 2026

DDG 125: April 2023 / July 2024

DDG 126: October 2025 / January 2027

DDG 128: October 2024 / January 2026

DDG 129: July 2025 / October 2026

DDG 130: September 2026 / December 2027

DDG 131: April 2026 / July 2027

DDG 132: May 2026 / August 2028

DDG 133: November 2026 / February 2028

DDG 134: November 2026 / March 2029

DDG 135: June 2027 / September 2028

DDG 136: June 2027 / September 2029

DDG 137: November 2027 / February 2029

DDG 138: December 2028 / March 2030

DDG 139: April 2028 / July 2029

Notes:

DDG 131 – DDG 139 reflect contract milestone dates.

Acronyms and Abbreviations

COEA - Cost and Operational Effectiveness Analysis

DNSARC - Department of the Navy System Acquisition Review Council

DSARC - Defense System Acquisition Review Council

ESSM - Evolved Sea Sparrow Missile

OPEVAL - Operational Evaluation

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Performance

Performance Characteristics				
SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Demonstrated Performance	Current Estimate
SHIP:				
Length (ft)				
466	N/A	N/A	Baseline Dependent	Baseline Dependent
Beam (ft)				
59	N/A	N/A	59	59
Navigational Draft (ft)				
30.6	N/A	N/A	31.0	31.0
Displacement (long tons)				
8300	N/A	N/A	9300	9300
Propulsion LM (Gas Turbine)				
2500	N/A	N/A	2500	2500
Accommodations				
341	N/A	N/A	314	314
MOBILITY:				
Speed (knots)				
30	30	30	30	30
Armament				
Anti-Submarine Warfare				
ASW System				
AN/SQQ-89	N/A	N/A	AN/SQQ-89	AN/SQQ-89
ASROC				
VLA	N/A	N/A	VLA	VLA
Helo				
SEAHAWK; LAMPS	2 EMBARKEDHELOS	2 EMBARKEDHELOS	2 Embarked Helos	2 Embarked Helos
Anti-Air Warfare				
Launchers				
MK 41 VLS	N/A	N/A	MK 41 VLS	MK 41 VLS
Missiles				

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SM-2 MR	N/A	N/A	SM-2 MR/SM-3/ESSM	SM-2 MR/SM-3/ESSM
Missile Fire Control System				
3 MK 99	N/A	N/A	3 MK 99	3 MK 99
Guns				
2 PHALANX	N/A	N/A	PHALANX	PHALANX
Anti-Surface/Strike Warfare				
Guns				
1 5"/54	N/A	N/A	1 5"/62	1 5"/62
Gunfire Control System				
MK 160	N/A	N/A	MK 160	MK 160
Anti-Ship Cruise Missile				
HARPOON	N/A	N/A	N/A	N/A
Cruise Missile				
TOMAHAWK	N/A	N/A	TOMAHAWK	TOMAHAWK
Electronic Warfare				
SLQ-32SRBOC	N/A	N/A	SLQ-32,SRBOC, Combat DF	SLQ-32, SRBOC, Combat DF
Radars				
Surface				
SPS-67	N/A	N/A	SPS-67	SPS-67/SPQ-9B
3D				
SPY-1D	N/A	N/A	SPY-1D (V)	SPY-1D (V)/SPY-6
Cost (Flight III BY14\$B)				
N/A	\$1.9	\$2.1	TBD	\$1.8
Energy (Flight III Fuel Consumption BBL/168 hours)				
N/A	5,500	8,500	TBD	8,500
Annual Energy (Flight III Fuel Consumption) BBL per ship, per year				
N/A	90,000	115,000	TBD	115,000
Schedule (IOC first Flight III ship)				
N/A	2nd Quarter FY 2024	4th Quarter FY 2024	TBD	4th Quarter FY 2024
Space (Flight III - Square feet of Unassigned Arrangeable Area)				
N/A	400	0	TBD	0
Weight SLA (Flight III Full Load Displacement in Long Tons)				

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N/A	at least 10 percent	at least 5 percent	TBD	at least 5 percent
Power SLA (Flight III MW remaining)				
N/A	at least 1.435	at least 1.125	TBD	at least 1.125
Cooling SLA (Flight III Rtons remaining)				
N/A	110	(T=O) 110	TBD	110
Sustainment (Flight III Material Availability)				
N/A	at least 63 percent	at least 52 percent	TBD	at least 52 percent
Sustainment (Flight III Operational Availability)				
N/A	at least 87 percent	at least 72 percent	TBD	at least 72 percent
Vertical Launching System (Flight III cells)				
N/A	96	(T=O) 96	TBD	96
Endurance (Flight III - Nm)				
N/A	5,000	4,000	TBD	4,000
Manpower (Flight III)				
N/A	No greater than 297 (with accommodations for 380)	No greater than 318 (with accommodations for 359)	TBD	No greater than 318 (with accommodations for 359)
Warfare Commander (Flight III)				
N/A	12 watch standers (9 officer/3 enlisted), 4 consoles, 1 PC Chat, SingleOffice/Planning Space	2 consoles, 1 PC Chat (Dual Use Space)	TBD	2 consoles, 1 PCChat (Dual use space)

Performance Notes:

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

Requirements Source:

Operational Requirements Document (ORD) dated April 15, 1994, and the DDG 51 Flight III Capability Development Document (CDD), October 28, 2014

Acronyms and Abbreviations

ASROC - Anti-Submarine Rocket
ASW - Anti-Submarine Warfare
BBL - Barrels
BY - Base Year
DF - Direction Finding
ESSM - Evolved Sea Sparrow Missile
FLT - Flight
ft - Feet
FTM - Flight Test Mission
HELO - Helicopter

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MK - Mark
MR - Medium Range
NM - Nautical Miles
Rtons - Refrigeration Tons
SLA - Service Life Allowance
SM-2 - Standard Missile 2
SM-3 - Standard Missile 3
SRBOC - Super Rapid Blooming Off-Board Chaff
TEMP - Test & Evaluation Master Plan
VLA - Vertical Launching ASROC (Anti-Submarine Rocket)
VLS - Vertical Launching System
YDS - Yards

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Acquisition Budget Estimate

Total Acquisition Cost

Category	Base Year	Development APB	APB Name (Current) Oct 2017		Budget Estimate PB 2023		Deviation
		Objective (BY\$)	Objective (BY\$)	Threshold (BY\$)	BY\$	TY\$	
RDT&E	FY 1987	953.1	3504.1	3854.5	3922.5	5854.7	11.9%
Procurement	FY 1987	15745.3	64949.2	71444.1	74655.3	134682.2	14.9%
MILCON	FY 1987	25.4	37.6	41.4	37.7	44.5	0.3%
Acq. O&M	FY 1987	0.0	0.0	0.0	0.0	0.0	N/A
Total		16723.8	68490.9	N/A	78615.5	140581.4	N/A
PAUC	FY 1987	727.1	769.6	846.5	778.4	1391.9	1.1%
APUC	FY 1987	684.5	729.8	802.7	739.2	1333.5	1.3%

Total End Item Quantity

Quantity Category	Current APB Quantity	Current Estimate Quantity
Development	0	0
Procurement	89	101

Budget Notes:

The December 2021 SAR is aligned with the PB 2023 budget submission, which includes funding only through FY 2028.

Cost Deviations Explanations:

The Procurement and RDT&E deviations are driven by the increase to the ship procurement profile from 89 to 101 and associated capabilities upgrades for the AEGIS Weapon System. A Program Deviation Report was sent to ASN(RD&A) on September 01, 2021.

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Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Procurement Cost (December 2021)	
1.	The Current Procurement Cost is sourced from the Department of the Navy's Component Cost Position (CCP) for the Arleigh Burke Class Guided Missile Destroyer, approved at a DON Cost Review Board on March 07, 2017. The CCP memo states "the DON acquisition community leadership recognizes the importance of multi-year procurement and cost reduction efforts, which are necessary to delivery fully capable ships within budget." The CAPE Preliminary Independent Estimate of Savings for the Fifth DDG 51 Arleigh Burke Class
2.	Destroyer Multi-Year Procurement (MYP) Authorization – A Detailed Report providing an independent estimate of savings for the FY 2023 – FY 2027 MYP will be provided at a future date.
Original Baseline Estimate (February 1988)	
1.	The Original Baseline Estimate for the program, was created in February 1988.
Revised Original Estimate (N/A)	
None	
Current Baseline Estimate (Oct 2017)	
1.	The Current Baseline Estimate reflects the Program Office Estimate for the Acquisition Program Baseline, approved by USD(AT&L) August 2017.

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Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 1987 \$M	BY 1987 \$M	% Change
	Current UCR Baseline (Oct 2017 APB)	Current Estimate (Dec 2021 SAR)	
Program Acquisition Unit Cost			
Cost	68490.9	78615.5	
Quantity	89	101	
Unit Cost	769.561	778.4	1.14
Average Procurement Unit Cost			
Cost	64949.2	74655.3	
Quantity	89	101	
Unit Cost	729.766	739.2	1.29

Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 1987 \$M	BY 1987 \$M	% Change
	Original UCR Baseline (Feb 1988 APB)	Current Estimate (Dec 2021 SAR)	
Program Acquisition Unit Cost			
Cost	16723.8	78615.5	
Quantity	23	101	
Unit Cost	727.122	778.4	7.05
Average Procurement Unit Cost			
Cost	15745.3	74655.3	
Quantity	23	101	
Unit Cost	684.578	739.2	7.97

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Contracts

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: DDG 120 Guided Missile Destroyer
Contractor: General Dynamics (GD), Bath Iron Works (BIW)
Contractor Location: 700 Washington Street
 Bath, ME 04530
Contract Number: N00024-13-C-2305/120
Contract Type: Fixed Price Incentive (Firm Target) (FPIF)
Award Date: March 14, 2014
Definitization Date: March 14, 2014

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	N/A	N/A	N/A	N/A

Cost and Schedule Variance Explanations

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

Notes

DDG 120 (one of three FY 2013 ships) is part of the FY 2013 - FY 2017 Multi-Year Procurement awarded on June 3, 2013.
 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:		DDG 121 Guided Missile Destroyer					
Contractor:		Huntington Ingalls Industries (HII)					
Contractor Location:		1000 Access Road Pascagoula, MS					
Contract Number:		N00024-13-C-2307/121					
Contract Type:		Fixed Price Incentive (Firm Target) (FPIF)					
Award Date:		June 03, 2013					
Definitization Date:		March 27, 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
N/A			N/A				

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

Notes							
DDG 121 (FY 2015 ship) is part of the FY 2013 - FY 2017 Multi-Year Procurement awarded on June 03, 2013.							
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.							

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Contract Identification

Appropriation: Procurement
Contract Name: DDG 122 Guided Missile Destroyer
Contractor: General Dynamics (GD), Bath Iron Works (BIW)
Contractor Location: 700 Washington Street
 Bath, ME 04530
Contract Number: N00024-13-C-2305/122
Contract Type: Fixed Price Incentive (Firm Target) (FPIF)
Award Date: June 03, 2013
Definitization Date: June 03, 2013

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	N/A		N/A	N/A

Cost and Schedule Variance Explanations

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

Notes

DDG 122 (FY 2015 ship) is part of the FY 2013 - FY 2017 Multi-Year Procurement awarded on June 03, 2013.

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.

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Contract Identification

Appropriation: Procurement
Contract Name: DDG 123 Guided Missile Destroyer
Contractor: Huntington Ingalls Industries (HII)
Contractor Location: 100 Access Road
 Pascagoula, MS 39567
Contract Number: N00024-13-C-2307/123
Contract Type: Fixed Price Incentive (Firm Target) (FPIF)
Award Date: June 03, 2013
Definitization Date: March 29, 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	N/A	N/A	N/A	N/A	

Cost and Schedule Variance Explanations

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

Notes

DDG 123 (FY 2016 ship) is part of the FY 2013 - FY 2017 Multi-Year Procurement awarded on June 03, 2013.

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.

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Contract Identification

Appropriation: Procurement
Contract Name: DDG 124 Guided Missile Destroyer
Contractor: General Dynamics (GD), Bath Iron Works (BIW)
Contractor Location: 700 Washington Street
 Bath, ME 04530
Contract Number: N00024-13-C-2305/124
Contract Type: Fixed Price Incentive (Firm Target) (FPIF)
Award Date: June 03, 2013
Definitization Date: June 03, 2013

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	N/A	N/A	N/A	N/A	

Cost and Schedule Variance Explanations

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

Notes

DDG 124 (one of three FY 2016 ships) is part of the FY 2013 - FY 2017 Multi-Year Procurement awarded on June 03, 2013.

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.

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Contract Identification

Appropriation: Procurement
Contract Name: DDG 125 Guided Missile Destroyer
Contractor: Huntington Ingalls Industries (HII)
Contractor Location: 1000 Access Road
 Pascagoula, MS
Contract Number: N00024-13-C-2307/125
Contract Type: Fixed Price Incentive (Firm Target) (FPIF)
Award Date: June 03, 2013
Definitization Date: June 03, 2014

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	N/A	N/A	N/A	N/A	

Cost and Schedule Variance Explanations

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

Notes

DDG 125 (one of two FY 2017 ships) is part of the FY 2013 - FY 2017 Multi-Year Procurement awarded on June 03, 2013. DDG 125 is the first FLT III.

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.

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Technologies and Systems Engineering

Significant Technical Risks

Significant Technical Risks	
Current Estimate (December 2021)	
1.	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.

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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	0.00%
Production	70	70	101	69.31%
Total Program Quantity Delivered	70	70	101	69.31%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	140581.4	Years Appropriated	43
Expended to Date	87664.6	Percent Years Appropriated	89.6%
Percent Expended	62.4%	Appropriated to Date	110848.9
Total Funding Years	48	Percent Appropriated	78.9

Data above as of
April 18, 2022.

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Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	October 30, 1986	October 30, 1986
Approved Quantity	9	9
Reference	Milestone IIIA Review Decision Memorandum	Milestone IIIA Review Decision Memorandum
Start Year	1985	1985
End Year	1989	1989

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Operating and Support Costs

Date of Estimate: April 04, 2022
Source of Estimate: NAVSEA 05C
Quantity to Sustain: 101
Unit of Measure: Ship
Service Life per Unit:
35 year service life assumed for DDG51 Flight (Flt) I and Flt II
40 year service life assumed for DDG51 Flt IIA and Flt III
Fiscal Years in Service: FY 1992 - FY 2073

DDG 51 FLT I and II have a 35 year Estimated Service Life (ESL); DDG FLT IIA and beyond have a 40 year ESL. Adjustments to individual ship ESLs will be evaluated based on combat capability and ship material condition.

Estimates are based on a service life of 35 years for 21 Flight I ships, and seven Flight II ships and 40 years service life for 47 Flight IIA ships, and 26 Flight III ships.

Sustainment Strategy

The DDG 51 sustainment strategy leverages Third Party Planning contracts, Indefinite Delivery/Indefinite Quantity (IDIQ) multi-award contracts within each a ship's homeport for Chief of Naval Operations (CNO) availabilities less than ten months and coast-wide Firm Fixed Priced Contracts for CNO availabilities greater than ten months. The program provides Integrated Logistics Support for hull, mechanical and electrical systems and oversight and guidance to Participating Acquisition Resource Managers that develop various sustainment approaches for combat systems and Communications, Command, Control, Computers, and Intelligence.

Antecedent Information

The Antecedent System is the CG 47 class of ships. The CG 47 class was used since it is the only other ship class with the AEGIS Weapon System installed. The CG 47 estimates were derived using the Naval Visibility And Management of Operation Support Costs (VAMOSC) database. CG 47 estimates are based on 27 ships. The years of data used for the CG 47 class are FY 1984-2020.

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Annual O&S Costs BY1987 \$M			
Cost Element	DDG 51 Average Annual Cost Per Ship		CG 47 (Antecedent) Average Annual Cost Per Ship
Unit-Level Manpower	10.203		10.226
Unit Operations	4.216		4.927
Maintenance	7.613		8.430
Sustaining Support	1.429		1.341
Continuing System Improvements	5.365		4.461
Indirect Support	6.457		6.982
Other	0.000		0.000
Total	35.283		36.368

Item	Total O&S Cost \$M			
	DDG 51			CG 47 (Antecedent)
	Current Production APB Objective/Threshold	Current Estimate		
Base Year	113493.3	124842.6	137,603.0	33,568.0
Then Year	326443.0	N/A	442,422	N/A

¹ APB O&S Cost Breach

Disposal Cost is included in the Operating and Support Cost of the current APB objective and threshold for this program. The DDG 51 APB is for 89 ships while the current estimate is for 101 ships.

Equation to Translate Annual Cost to Total Cost

DDG 51 (Ship Quantity X Avg. Annual Cost per Ship, per Year X Ship Service Life) (28 ships X \$35.283M X 35 years) + (73 ships X \$35.283M X 40 years) = \$137,603M

CG 47 (Ship quantity X Avg. Annual Cost per Ship, per Year X Ship Service Life) (11 ships X \$36.368M X 40 years) + (11 ships X \$36.368M X 35 years) + (1 ship X \$36.368M X 21 years) + (2 ships X 36.368M X 20 years) + (1 ship X \$36.368 X 19 years) + (1 ship X \$36.368M X 18 years) = \$33,568M