DDG 51 Program Highlights

• DDG 51 program in serial production with 21 ships currently under contract at two shipyards

• DDG 51 Flight III on Track (FY17 and Follow ships)
  – First Flight III, DDG 125 (HII Ingalls) achieved Lay Keel on 07 Oct 2019 with a ceremony held on 07 Nov 2019
  – Flight III delivery planned in FY23 with IOC planned in FY24
  – First AN/SPY-6(V)1 arrays scheduled to arrive in HII Ingalls shipyard in June 2020

• FY18-22 Multiyear Procurement contracts awarded Sept 2018
  – BIW awarded 5 Flight III ships including one Option ship
  – HII awarded 6 Flight III ships
  – First FY18-22 MYP ship, DDG 128, to start fabrication in April 2020

13 Flight III Ships Under Contract through FY22
DDG 51 Program Overview

• The DDG 51 Class are multi-mission warships designed, built and netted to execute Sea Control and Power Projection missions

• Warfighting Requirements Foundations
  – Flight I: TLR-1983
  – Flight IIA: ORD-1994
  – Flight III: CDD-2014

• Warfighting Capabilities:
  – Integrated Air and Missile Defense (IAMD)
  – Strike Warfare (STW)
  – Anti-Submarine Warfare (ASW)
  – Anti-Surface Warfare (ASuW)
  – Intelligence, Surveillance, and Reconnaissance (ISR)
  – Naval Surface Fire Support (NSFS)
Flight III Changes

**Full Load Operational Displacement Enhancement System (FLODES)**
- Added starboard enclosure and stacked RHIBs

**AN/SPY-6(V)1; AMDR-S SPY+15dB**
- 14.1 ft x 13.6 ft x 5 ft Array Structure
- Replaces AN/SPY-1D(V)

**BL 10 / TI 16 for Flight III Upgrade to AWS**
- Added 3 Warfare Commander consoles

**Rapid Removal Routes**
- Incorporates reservations for depot level structural cuts to facilitate future Combat Systems equipment upgrades

**AC Plant**
- 5 x 350 Ton HES-C AC Plants
- Replacing 5 x 200 Ton AC Plants

**4160VAC Electric Plant**
- 3 x 4MW, 4160 VAC SSGTGs replacing 3 x 3MW, 450 VAC SSGTGs
- Add ship service transformers, PCMs, modified switchgear
- Modified controls for MCS and MFMs

**Enclosures**
- Added starboard enclosure and stacked RHIBs

**Water Mist**
- Baseline change to install Water Mist in Machinery Spaces to replace Halon 1301

**Heptafluoropropane (HFP)**
- HFP in Gas Turbine Modules & Flammable Liquid Storerooms replaces Halon 1301

**Increased Innerbottom Scantlings**
- Adds 90 LT to improve KG

**Habitability Changes** and roll-down impacts to incorporate AN/SPY-6(V)1 and equipment

**Capability Increase**

**Enabling Changes**

**Other Changes**
DDG 125 (JACK H. LUCAS) Construction

• DDG 125 is the first Flight III ship
  – Flight III baseline 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

• DDG 51 Flight III Ships on Track (FY17 and Follow ships)
  – DDG 125 (HII Ingalls) Start Fab achieved 07 May 2018
  – Ship currently 24% complete

• Production Milestones
  ✔ Start Fab: 07 May 2018
  ✔ Lay Keel: 07 Oct 2019
  ✔ Lay Keel Ceremony: 07 Nov 2019
  – Float Off: Jul 2021
  – AEGIS Light Off: Jan 2022
  – Delivery: Apr 2023
  – Initial Operating Capability: 2024
Flight III Testing

• Flight III Electric Plant Testing
  – Electric plant hardware integration testing has started at the Land Based Engineering Site (LBES) in Philadelphia, PA
  – Industry partners are engaged to support the FLT III HM&E integration efforts
  – Recent accomplishments include:
    ▪ 9160 Generator Initial Light Off
    ▪ Completion of Power Conversion Module (PCM1) stand-alone testing

• CSEDS SPY-6 Power Distribution Testing
  – Aegis Baseline 10/SPY-6 interface and power distribution testing ongoing at the Combat System Engineering Development Site (CSEDS) in Moorestown, NJ
AN/SPY-6(V)1 Air & Missile Defense Radar Overview

- Missions
  - Simultaneous:
    - Ballistic Missile Defense
    - Air Defense (Anti-Air Warfare)
    - Anti-Surface Warfare
  - With simultaneous weapons support functions:
    - Electronic Protection
    - Environmental Awareness

- Radar Suite
  - AN/SPY-6(V)1 AMDR
    - Next generation S-band solid-state radar with digital beamforming architecture
  - X-Band radar (AN/SPQ-9B)
    - Horizon search to complement AN/SPY-6(V)1
  - Radar Suite Controller (RSC)
    - Radar resource management, coordination and interface to the AEGIS combat system

Highly capable, efficient and reliable
AN/SPY-6(V)1 AMDR Overview

Each Array
- Radiator (37x)
- Radar Modular Assembly (37x)
- Calibration ¼ RMA (2x)
- Inertial Navigation System (1x)

Arrays (4)
- 4 Faces
- 37 RMAs per Face
- 144 T/R Modules per RMA
- 5,328 T/R Modules per Face

Array Control
- AIU (2)

Signal & Data Processing Subsystems
- Beams
- Detections
- Digital Signal Processing

Power Subsystems
- Main Power Distribution Unit
- 1,000VDC
- Arc Fault Detector
- 208VAC
- Array Power Distribution Unit (4)
- 1,000VDC

Cooling Subsystem
- Cooling Equipment Unit (2)
- Cooling Equipment (37x)

Other Subsystems
- AN/SPQ-9B Tracks
- 440VAC
- 1,000VDC
- Ship’s Power
- Battery (2)
- UPS Filter (3)
- UPS Soft Start
- Uninterruptable Power Supply (3)
- Radar Control Processor / Radar Suite Controller

Inertial Navigation System (1x)

DDG 51 Flight III
AEGIS Baseline 10 Combat System

Plus Capabilities From Previous Baselines:
- NIFC
- IAMD
- ASW
- ASUW
- Passive EW

Next Generation IAMD Capability
Concurrent Raids of Air & Ballistic Missile Threats
Buying Back Battlespace from Evolving Threats

Why Does AEGIS Baseline 10 Matter?

• BL 10.0 brings greatly increased single ship IAMD capabilities to pace current and future threats

• The systems engineering and integration of major new AEGIS Weapon and Combat System elements ensure a coordinated system response to the threat

• FLT III is poised to take the lead on force level command

• Integration efforts are on track to support USS Jack H. Lucas (DDG 125) ALO in JAN 2022

BL 10.0 integration of SPY-6 sets the technical foundation for The Fleet
Summary

- DDG 51 program remains one the most successful shipbuilding programs with 67 ships delivered to the Fleet.
- Shipyards have established serial DDG 51 production with 21 ships on contract through FY22.
- Flight III will keep pace with Integrated Air and Missile Defense (IAMD) threats. Thirteen Flight III ships are currently on contract.

Delivering capability to the fleet for current and future missions.