DDG 1000 Class Destroyer

DDG 1000 Overview

11 January 2017

Surface Navy Association (SNA)
29th National Symposium

DDG 1000 Program Manager, PMS 500

CAPT Kevin Smith

DDG 1000/1001/1002


DDG 1000

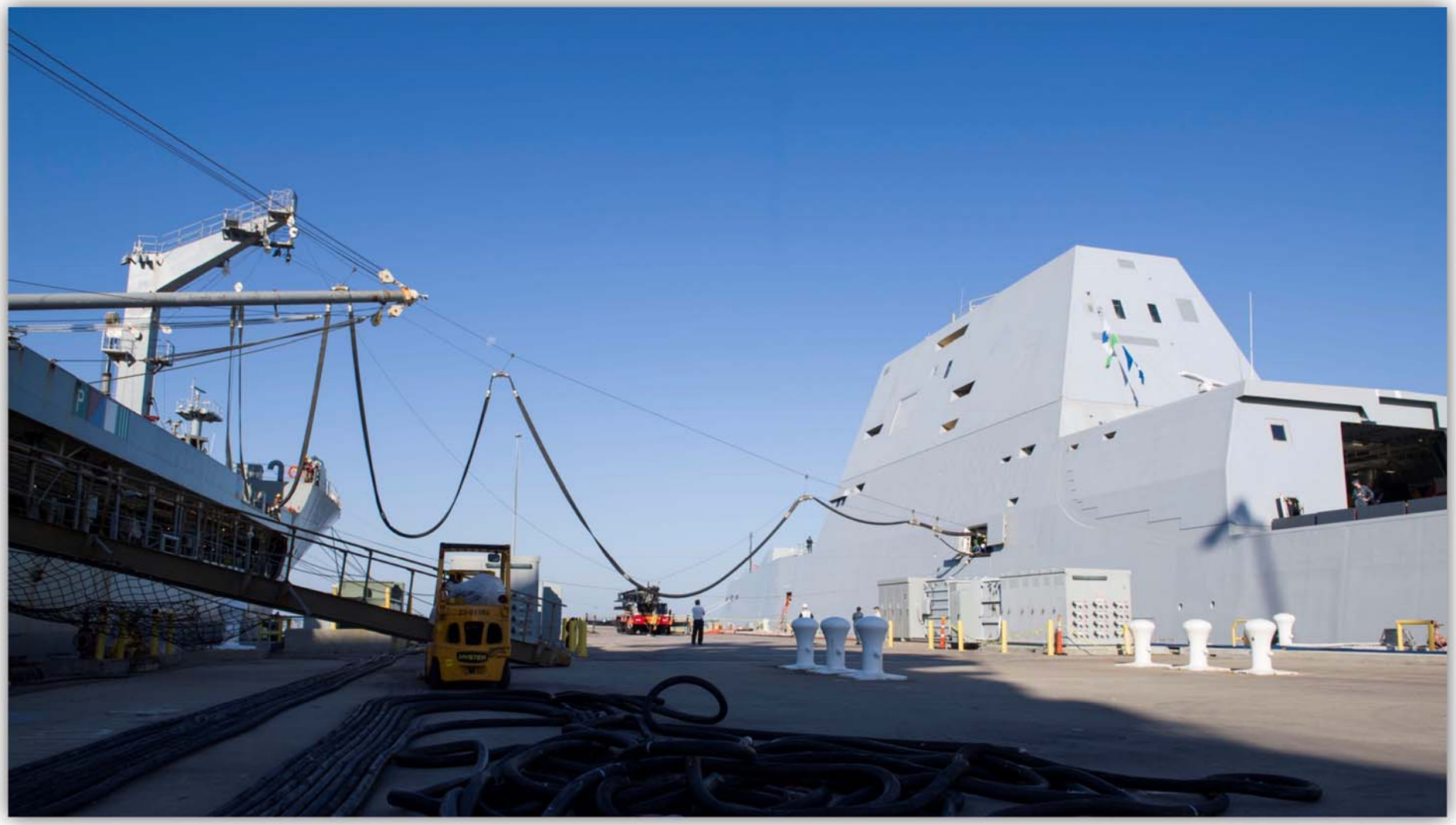

DDG 1001

DDG 1002 Pre-Fabrication Units
94 of 94 Under Construction

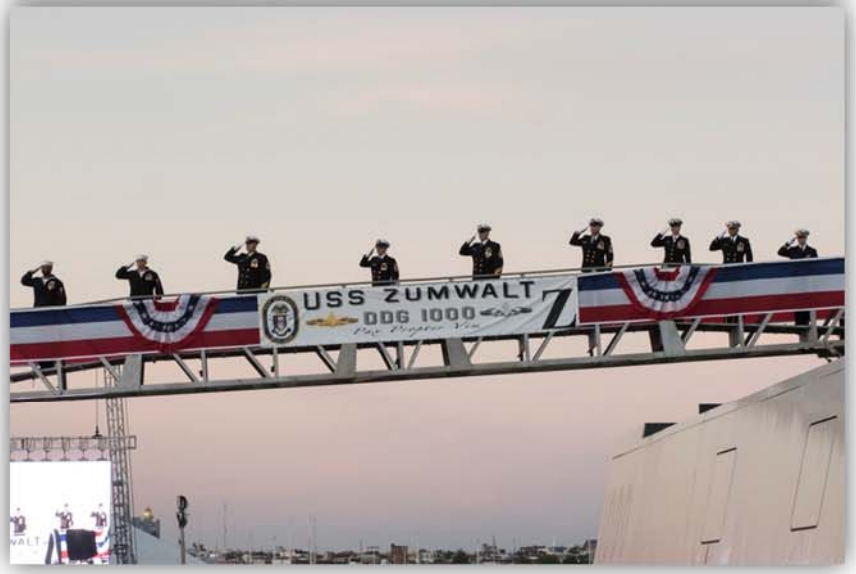
DDG 1000 Sail Away
7 September 2016

DDG 1000 Newport, RI
8 September 2016

DDG 1000 Norfolk, VA
14 September 2016



DDG 1000 Baltimore, MD
15 October 2016



DDG 1000 San Diego, CA
8 December 2016

DDG 1000 Program Highlights

- **DDG 1000 arrived San Diego, CA 8 Dec 2016**
  - Commissioning in Baltimore, MD 15 Oct 2016 prior to sail around and arrival in her homeport
  - Early combat systems activation and Test & Evaluation activities completed during transit
- **DDG 1000 Post Delivery Availability (PDA) and Combat Systems Activation (CSA) activities will commence Jan 2017**
  - Industrial work will be completed in San Diego in preparation to activate combat systems (weapons, sensors and communications)
  - Test & Evaluation to commence in FY18 prior to IOC in FY20
- **Started DDG 1001 fabrication March 2010 – 91% complete (total ship) (as of 27 Nov 2016)**
  - Hangar arrived Oct 2013, deckhouse arrived Sep 2014 at BIW and erected Nov 2014
  - Christening completed 18 Jun, Float Off completed 20 Jun
  - ~ 17,000 of 344,000 work orders remaining; test & activation underway
- **Started DDG 1002 fabrication April 2012 – 59% complete (total ship) (as of 27 Nov 2016)**
  - Fabrication underway – 55% complete; 94 of 94 units under construction
  - Material at 68% complete
  - Steel deckhouse / hangar design complete, production 46% complete
- **Integrated Power System (IPS) provides complete electric plant integration**
  - Generates approximately 78 megawatts allowing for integration of future emerging technologies

DDG 1000 Requirements

- Carry the fight to the enemy through offensive operations and destroy enemy targets ashore with precision strike and volume fires
- Contribute to littoral dominance: surface, air, sub-surface
- Employ an open architecture total ship computing approach
- Be highly survivable
- Reduce crew size

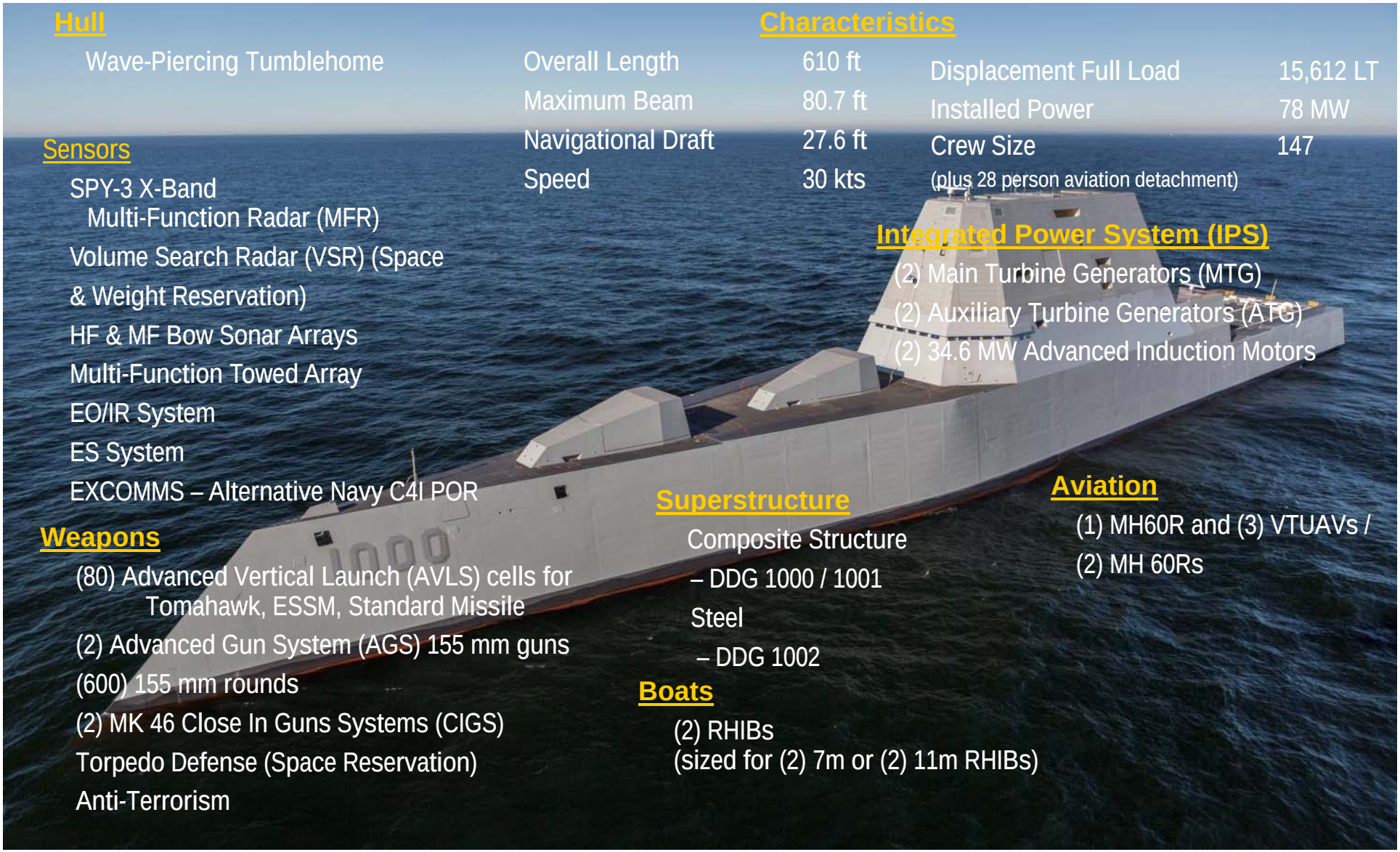
Requirements Document

- DD(X) Operational Requirements Document, Change 1 approved, dated Jan 2006
- DD(X) will transition from a single step to full capability approach to a spiral acquisition
  - Spiral acquisition fields operationally and supportable capability in as short a time as possible, with the explicit intent of delivering improved or updated capability in the future
- Acquisition Risk Mitigated thru spiral development, modeling & simulation, and a combination of land-based / at-sea testing

Key Performance Parameters	Threshold	Objective
Interoperability	Top Level IERs	All IERs
Number of Guns	2	2
Gun Magazine Capacity	600	1200
Vertical Launch Cells	80	128
Radar Cross Section		
Manning	175	125
Survivability (5)		
Force Protection (2)		

Designed to meet all requirements; Evolutionary Acquisition – Spiral Development

DDG 1000 Characteristics



Hull

Wave-Piercing Tumblehome

Characteristics

Overall Length	610 ft
Maximum Beam	80.7 ft
Navigational Draft	27.6 ft
Speed	30 kts
Displacement Full Load	15,612 LT
Installed Power	78 MW
Crew Size	147

(plus 28 person aviation detachment)

Sensors

SPY-3 X-Band Multi-Function Radar (MFR)
Volume Search Radar (VSR) (Space & Weight Reservation)
HF & MF Bow Sonar Arrays
Multi-Function Towed Array
EO/IR System
ES System
EXCOMMS – Alternative Navy C4I POR

Integrated Power System (IPS)

(2) Main Turbine Generators (MTG)
(2) Auxiliary Turbine Generators (ATG)
(2) 34.6 MW Advanced Induction Motors

Weapons

(80) Advanced Vertical Launch (AVLS) cells for Tomahawk, ESSM, Standard Missile
(2) Advanced Gun System (AGS) 155 mm guns
(600) 155 mm rounds
(2) MK 46 Close In Guns Systems (CIGS)
Torpedo Defense (Space Reservation)
Anti-Terrorism

Superstructure

Composite Structure – DDG 1000 / 1001
Steel – DDG 1002

Aviation

(1) MH60R and (3) VTUAVs / (2) MH 60Rs

Boats

(2) RHIBs
(sized for (2) 7m or (2) 11m RHIBs)

DDG 1000 Critical Technologies

Engineering Development Models (EDMs) Used to Mitigate Production Risk Prior to Milestone B Decision

Dual Band Radar (DBR)

- MFR (X Band) at sea-based testing complete
- VSR (S Band) land based testing complete
- Leap ahead clutter rejection capability in the littorals
- MFR Volume Search modification complete
- MFR Testing underway
  - Wallops (2015-2017)
  - SDTS (2018)
  - DDG 1000 (2016-2018)

Composite Deckhouse & Apertures Test Article

- Composite production ability proven
- Tested for RCS and EMI
- Validated RCS KPP can be achieved

Advanced Gun System (AGS)

- Full scale Gun and Magazine produced
- Automated Magazine and Gun rate of fire validated
- Commenced testing onboard DDG 1000

Peripheral Vertical Launch System (PVLS) / Advanced VLS

- Detonation tests and missile restrained firing testing complete
- Enhanced survivability design proven and ability to carry all current missiles (SM 2/3/6, ESSM, VLA with CEU mods)
- Commenced testing onboard DDG 1000

Integrated Power System (IPS)

- Full scale testing of components
- Full rated power and torque validated
- Full Power testing completed
- ECS LBTS testing completed
- HM&E Activation Complete
  - Alpha Trials Dec 2015
  - Builder's Trials Mar 2016
  - Acceptance Trials Apr 2016

Total Ship Computing Environment (TSCE)

- Software Releases 1-8 complete
- Open Architecture principles applied
- Release 7 supported DDG 1000 sail around
- Commenced testing onboard DDG 1000
- Release 8 ready for install onboard DDG 1000 early 2017

Hull Form Scale Models

- Sea keeping, stability and RCS performance validated by model testing
- Underwater explosion testing complete – hull whipping requirement validated
- Heavy Weather Guidance received June 2015

Integrated Undersea Warfare (IUSW)

- At-sea mine avoidance capability proven
- Reduced ASW manning validated
- Commenced testing onboard DDG 1000

Autonomic Fire Suppression System (AFSS)

- At-sea weapons effect autonomic fire suppression testing demonstrated
- Critical technology enables reduced manning

Summary

- **DDG 1000 will be a multi-mission surface combatant tailored for the littorals**
  - Signature reduction, active and passive self-defense systems, and enhanced survivability features
  - Designed to fulfill volume firepower and precision strike requirements
  - Provides credible forward naval presence while operating independently or as an integral part of Naval, Joint, or Combined Expeditionary Strike Forces
  - Reduced Life Cycle Cost

- **HM&E delivery of DDG 1000 completed 20 May 2016**
  - Commissioned 15 Oct 2016 in Baltimore, MD; arrived San Diego, CA 8 Dec 2016
  - Commenced Post Delivery Availability (PDA) / Combat Systems Activation (CSA) in homeport San Diego

- **DDG 1001,1002 under contract and significant production underway**
  - DDG 1001/1002 completion 91% / 59% as of Nov 2016