

# AEGIS – Ballistic Missile Defense



- 2 Cruisers and 1 Destroyer are Capable of Firing SM-3 Interceptors and Conducting Long Range Surveillance and Tracking Operations (LRS&T)
- 10 Destroyers are Capable of Conducting LRS&T
- Gap-Filler Sea Based Terminal is in Progress
  - Aegis BMD modifying baseline computer program
  - PEO IWS modifying SM-2 Blk IV missiles
  - Demonstrated success with Linebacker

*A Success Story*

# Aegis BMD - Delivered to Date

## Engagement (BMD 3.6, BMD 3.0, SM-3 Blk I) and LRS&T



USS STETHEM (DDG 63)

BMD 3.6



USS SHILOH (CG 67)

BMD 3.6



USS LAKE ERIE (CG 70)

(BMD 3.6 Sep 06)

BMD 3.0



USS PORT ROYAL (CG 73)

(BMD 3.6 Dec 06)

BMD 3.0



USS CURTIS WILBUR (DDG 54)



First SM-3 Blk I's - Nov 2004 -  
11 Rounds Delivered as of Aug 06



First SM-3 Blk IA Encanned  
2 Rounds Delivered as of 31 Aug 06

## LRS&T (BMD 3.0E)



USS JOHN S. MCCAIN (DDG 56)



USS FITZGERALD (DDG 62)



USS RUSSELL (DDG 59)



USS MILIUS (DDG 69)



USS PAUL HAMILTON (DDG 60)



USS JOHN PAUL JONES (DDG 53)



USS BENFOLD (DDG 65)



USS HOPPER (DDG 70)



USS O'KANE (DDG 77)



USS HIGGINS (DDG 77)

Upgrade Installation in Progress

# Littoral Combat Ship

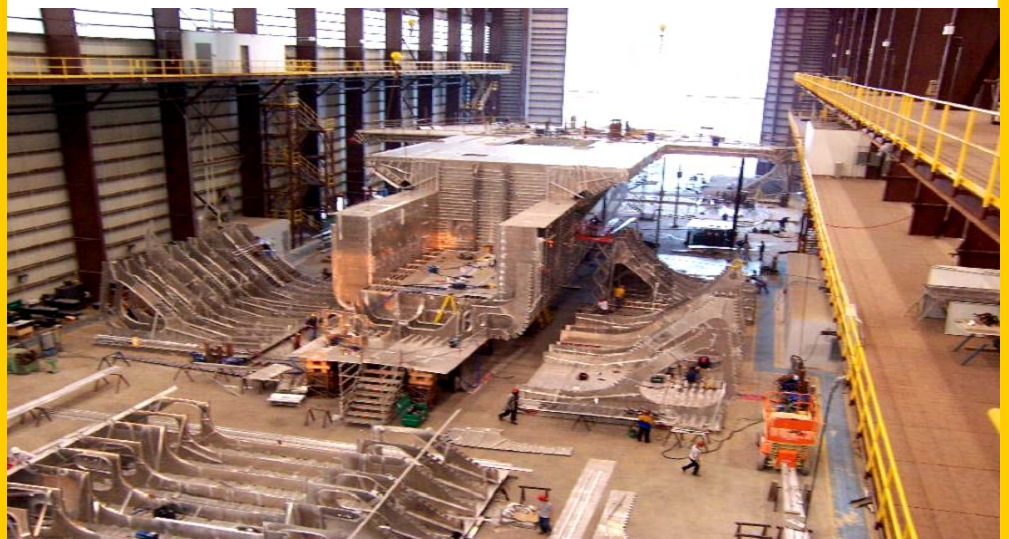
## Lockheed Martin Team

Lockheed Martin  
Gibbs & Cox  
Marinette Marine  
Bollinger Shipyards



## General Dynamics

Bath Iron Works  
General Dynamics AIS  
Austal USA  
BAE Systems  
MAPC  
L3



# LCS Mission Package Capability

## Mine Warfare

## Antisubmarine Warfare

## Surface Warfare

VTUAV



USV



RMS



MH-60S



COBRA



Beach/Surf Zone Detection

UUV




UUV




EOD




MH-60R



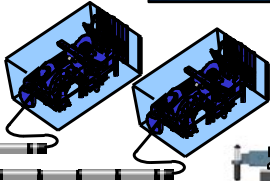
RMS



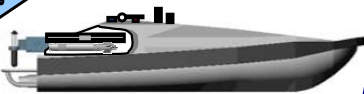
VTUAV



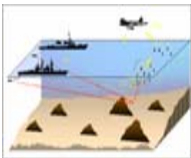
TOWED ARRAY



USV



MULTISTATIC



MH-60R/S



VTUAV



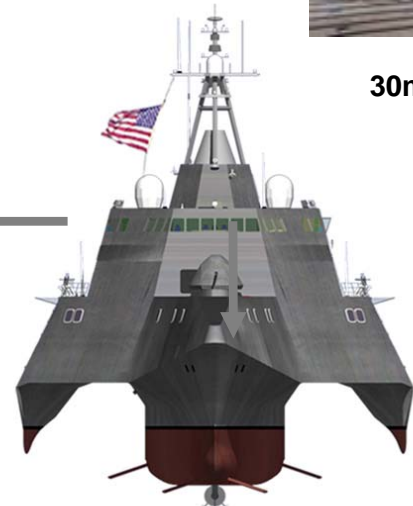
NETFIRES



30mm Gun



Installed in Mission Module Spaces



# DDG 1000

## Sensors

Dual Band Radar  
Acoustic Sensor Suite  
EO / IR System

## Characteristics

Length	610 ft	Displacement	14,564 LT
Beam	81 ft	Installed Power	78 MW
Draft	28 ft	Crew Size	150
Speed	30 kts		

## Integrated Power System

(2) 36 MW large gas turbine gensets  
(2) 4 MW small gas turbine gensets  
(2) 34 MW propulsion motors

## Weapons

(80) cells  
(2) VL AGS 155mm guns  
(600) 155mm rounds  
(2) 57mm guns

## Superstructure

Composite structure

## Hull

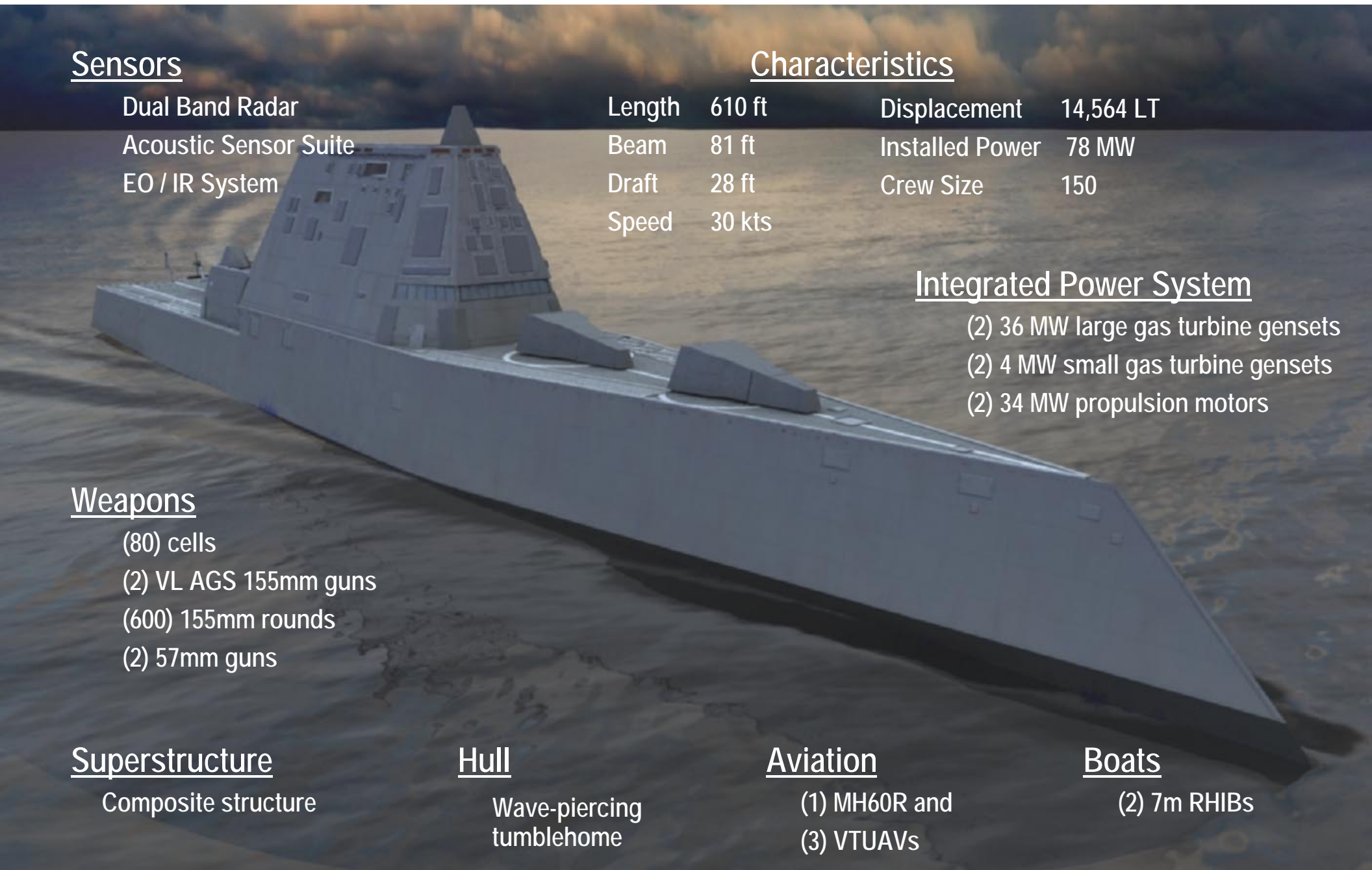
Wave-piercing  
tumblehome

## Aviation

(1) MH60R and  
(3) VTUAVs

## Boats

(2) 7m RHIBs



# Cruiser Modernization

## CG Baselines 2,3,4

### BMC4I

- CEC
- SGS A/C (B/L 2)
- CDLMS (B/L 2)

### AIR DOMINANCE

- AWS CR2 Computer Program
- COTS computing plant
- Radar and Display upgrades
- VLS Modifications

### FORCE PROTECTION

- ESSM
- CIWS BLK 1B
- SPQ-9B (ASMD)
- SARTIS
- SQQ-89A(V)15 (B/L 3 & 4)

### GUN WEAPON SYSTEM

- (2) 5 inch/62 Guns
- MK-160 Gun Computing System
- OSS

### HM&E

- All Electric Mods
- Smart Ship Upgrades
- Structural Modifications
- Quality of Service Upgrades

FY06 FY07 FY08 FY09 FY10 FY11 FY12 FY13 FY14 FY15 FY16

<b>Full Mod</b>	0	0	1	1	2	1	3	3	3	3	2
<b>HM&amp;E</b>	1	2	1	0	0	0	0	0	0	0	0
<b>C/S</b>	0	0	0	1	0	2	0	0	0	0	0

B/L 2=CG52-58  
 B/L 3=CG59-64  
 B/L 4=CG65-73



# Destroyer Modernization

## Candidates

### Warfighting Upgrades

#### C4I

NAVSSI BLK 4  
IFF Modes 5  
CEC

#### AIR DOMINANCE

CIC Display Upgrades  
Open Architecture Computing Plant  
VLS Mods (TACTOM/SM-2Blk4/ESSM/  
Initial SM-6 Capability)  
AWS CR-3 Computer Program  
SPY-1D(V) COTS SIGPRO  
SPY-1D Transmitter Upgrades  
Multi-Mission BMD Capability  
IABM  
SM6/NIFC-CA  
ESSM / STAMO Upgrades

#### FORCE PROTECTION

CIWS-1B  
NULKA  
SEWIP  
SSTD (ATT)  
MK 54 Torpedo/DFCI  
SQQ-89A(V)15 w/MFTA

#### GUN WEAPON SYSTEM

MK-160 Mod X Gun Computing System

#### HM&E Modernization

Full IBS Upgrade  
MCS/DCS Upgrades  
GEDMS  
Wireless Communications  
Digital Video Surveillance  
Quality of Life Upgrades  
Advanced Galley  
Mission Life Extension Upgrades

	<u>FY10</u>	<u>FY 11</u>	<u>FY12</u>	<u>FY13</u>	<u>FY14</u>	<u>FY15</u>	<u>FY16</u>
HM&E	2	3	3	3	3	3	3
CS			2	3	3	3	3

*BACK UP*





# Cruiser & Destroyer Modernization

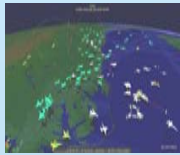
**Mid-life modernization enables CG47 and DDG 51 class ships to achieve 35 year service life. Average life of unmodernized surface combatants < 20 years. Current 22 CG47s and 62 DDG 51s are required to achieve CNO's 2020 force structure**

• The CG and DDG Mod Programs consists of upgrades to address changes in technology and likely threats since initial design that will ensure these ships are relevant through the 2020's.

- Upgrade to All Electric to improve QOL and save manpower and maint \$ (>\$4.7M per year – CG 47 only)
- Hull strengthening and stability mods to correct class issues
- Smart Ship type installations to save manpower through better use of technology
- Use of COTS to field 2nd and 3<sup>rd</sup> spirals of OA computing plant to support affordable and rapid future capability upgrades.
- Improvement to strike group interoperability and data sharing
- Improved capability against complex, high speed/maneuverable ASCMs
- Improved AAW capability against small fast targets in clutter environment
- Improved littoral SA and hard kill against low flying a/c and fast in-shore attack craft
- Improved USW and enhanced torpedo defense, especially in littorals

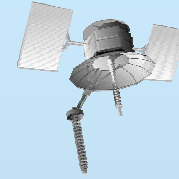
**4 AEGIS ships can be modernized to achieve almost twice current average service life for less than the cost of 1 new AEGIS combatant**

# Cruiser Modernization



7PH 1C Computer Program,  
Cooperative Engagement  
Capability (CEC) &  
Common Data Link Management  
System (CDLMS)

Robust Joint  
Command  
& Control



"Smart Ship"  
COTS-based  
Integrated  
Control Systems



Navy Precision Fires:  
5" / 62 Gun/MK 160 GCS



ASW:  
SQQ 89A V(15)



VLS Mods:  
Tactical Tomahawk



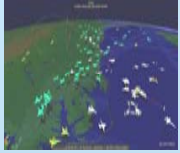
Force Protection:  
CIWS BLK 1B, Evolved Sea  
Sparrow Missile &  
SPQ-9B

MH-60R



**Transforming the Existing Fleet**

# DDG Proposed Upgrades



OA Computing Environment,  
Cooperative Engagement  
Capability (CEC)

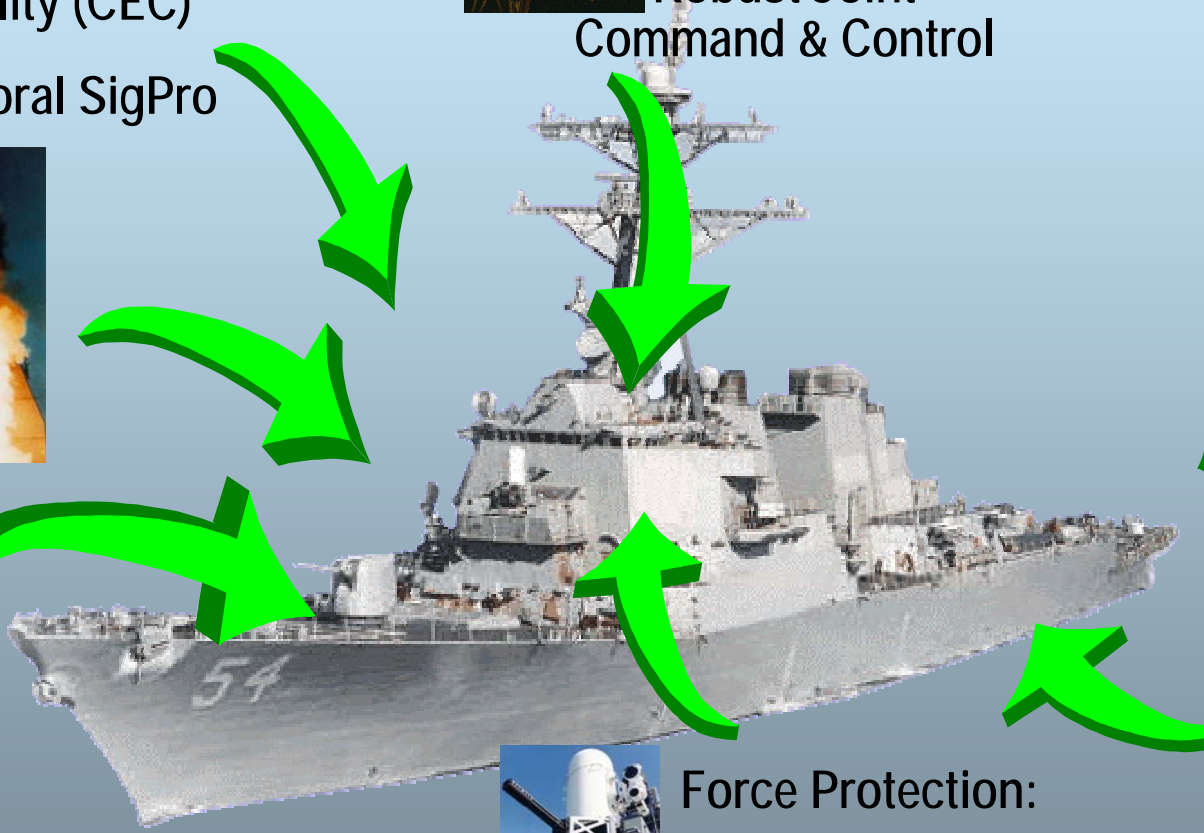


Robust Joint  
Command & Control

TBMD & Littoral SigPro



Tactical  
Tomahawk



ASW: SQQ 89A(V) 15



Force Protection:  
CIWS BLK 1B, Evolved  
Sea Sparrow Missile, SM-6



MH-60R

**Building and Transforming the Existing Fleet**

# DDG Mod HM&E Upgrades

ADVANCED GALLEY



DIGITAL VIDEO SURVEILLANCE SYSTEM



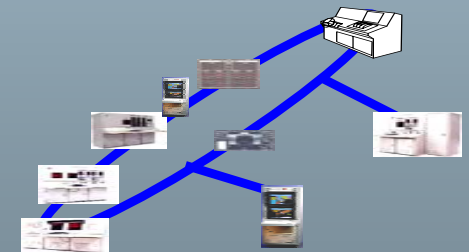
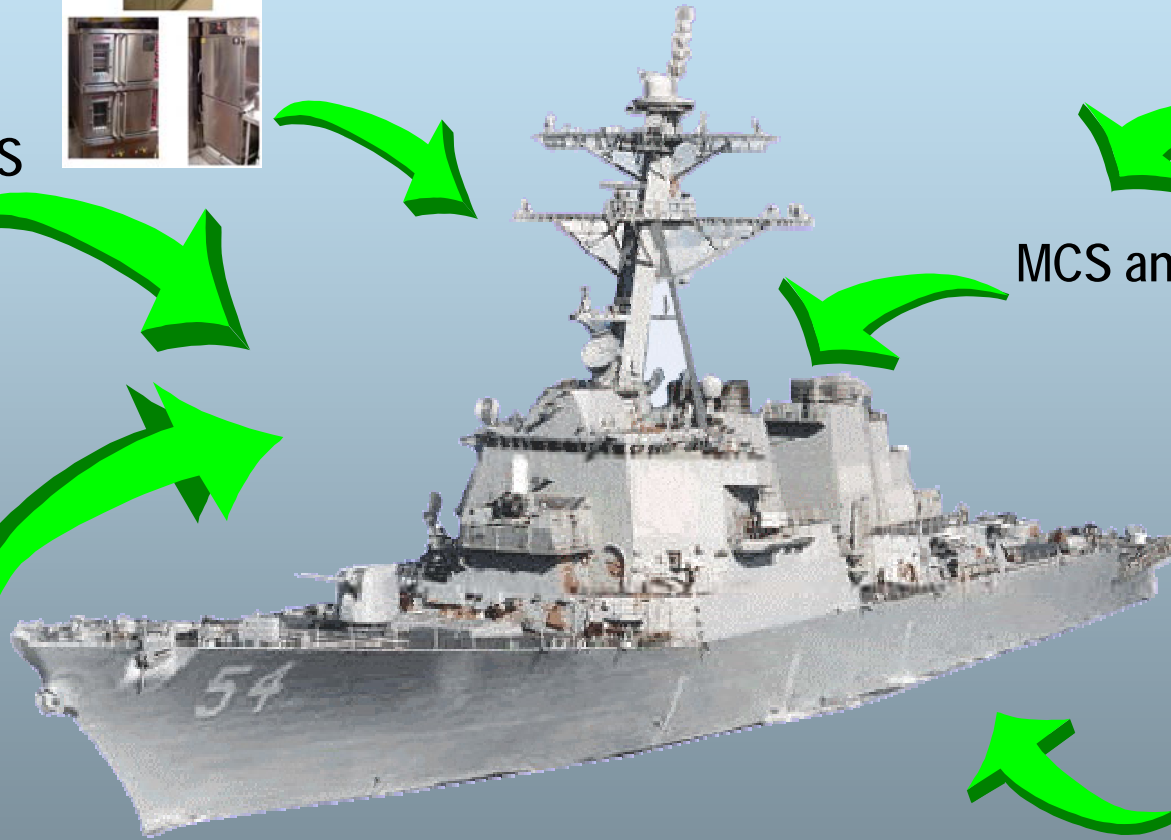
WIRELESS COMMS



MCS and DAMAGE CONTROL UPGRADES



INTEGRATED BRIDGE



GIGABIT ETHERNET LAN

**Achieving the Full Service Life**