



Systems Engineering – A Former PM's Perspective



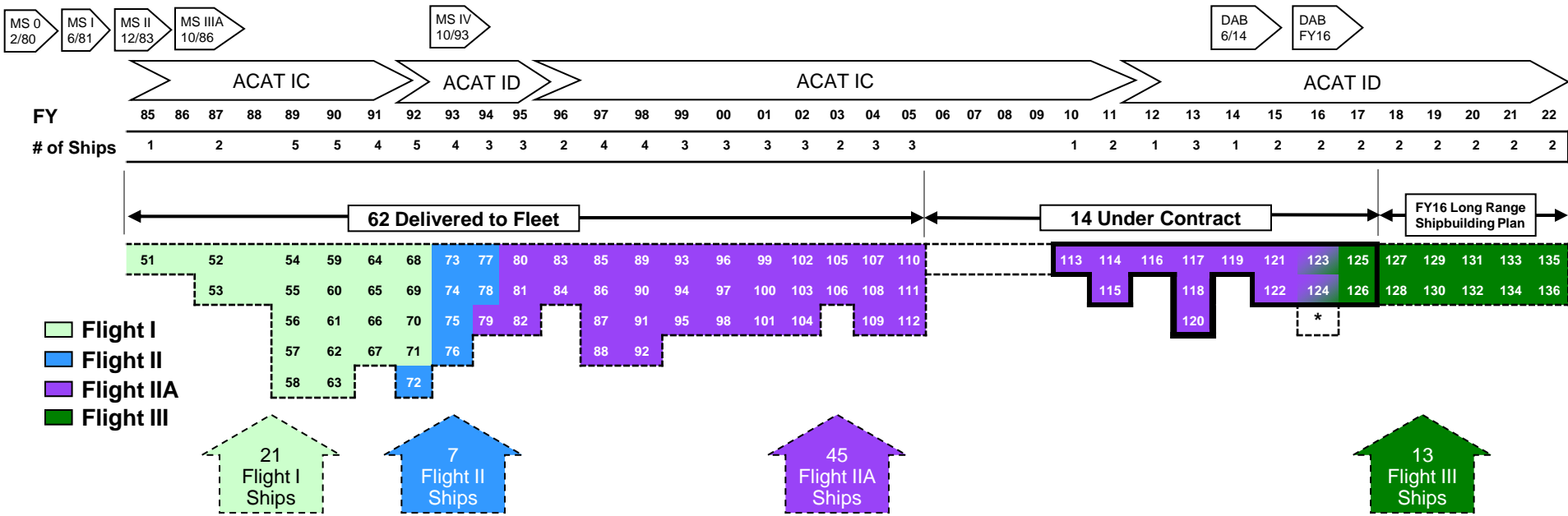
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DDG 51 Class Shipbuilding Profile



	FY98-01 MYP										FY02-05 MYP					FY13-17 MYP					FUTURE AWARD																	
BIW	1	1	3	2	2	3	3	2	1	1	1	2	2	1	1	2	2	1	2	2	1	1	1	1	1	2	1	1	1	1	TBD	TBD	TBD	TBD	TBD			
Ingalls		1	2	3	2	2	1	1	2	1	1	2	2	2	1	1	1	1	1	1			1	1	1	1	1	1	1	1	1	TBD	TBD	TBD	TBD	TBD		
FY	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22

ACQUISITION STRATEGIES	
Competition For Work	27
Negotiated Allocation	7
Competition for Profit (PRO)	8
Multi-Year (PRO)	34
TBD	10
Total	86

	DELIVERED	UNDER CONTRACT	TOTAL
BIW	34	7	41
Ingalls	28	7	35

* Acquisition Strategy and Configuration for 3rd FY16 ship under review



Aristotle's Golden Mean



Every art and every inquiry, and similarly every action *and technology*, is thought to aim at some good; and for this reason the good has rightly been declared to be that at which all things aim ... now, as there are many arts and sciences, their ends also are many; the end of the medical art is health, *that of shipbuilding a vessel*, that of strategy victory, that of economics wealth.

Deficiency (-)
(Vice)

Balance
(Virtue)

Excess (+)
(Vice)



Cowardice

COURAGE

Rashness

Self-indulgence

TEMPERANCE

Insensibility

Indecisiveness

SELF CONTROL

Impulsiveness

Shipbuilding		
Flexible	RECONFIGURABLE	Survivable
Proprietary	COMMONALITY	Open
Performance	AFFORDABILITY	Cost

“It is best to rise from life as from a banquet, neither thirsty nor drunken”



Primary Flight III Changes

Enclosures

- Added starboard enclosures and stacked boats for displaced equip & stores

AMDR-S

- Replacing AN/SPY-1D(V)

ACB Next / TI Next Upgrade to AWS

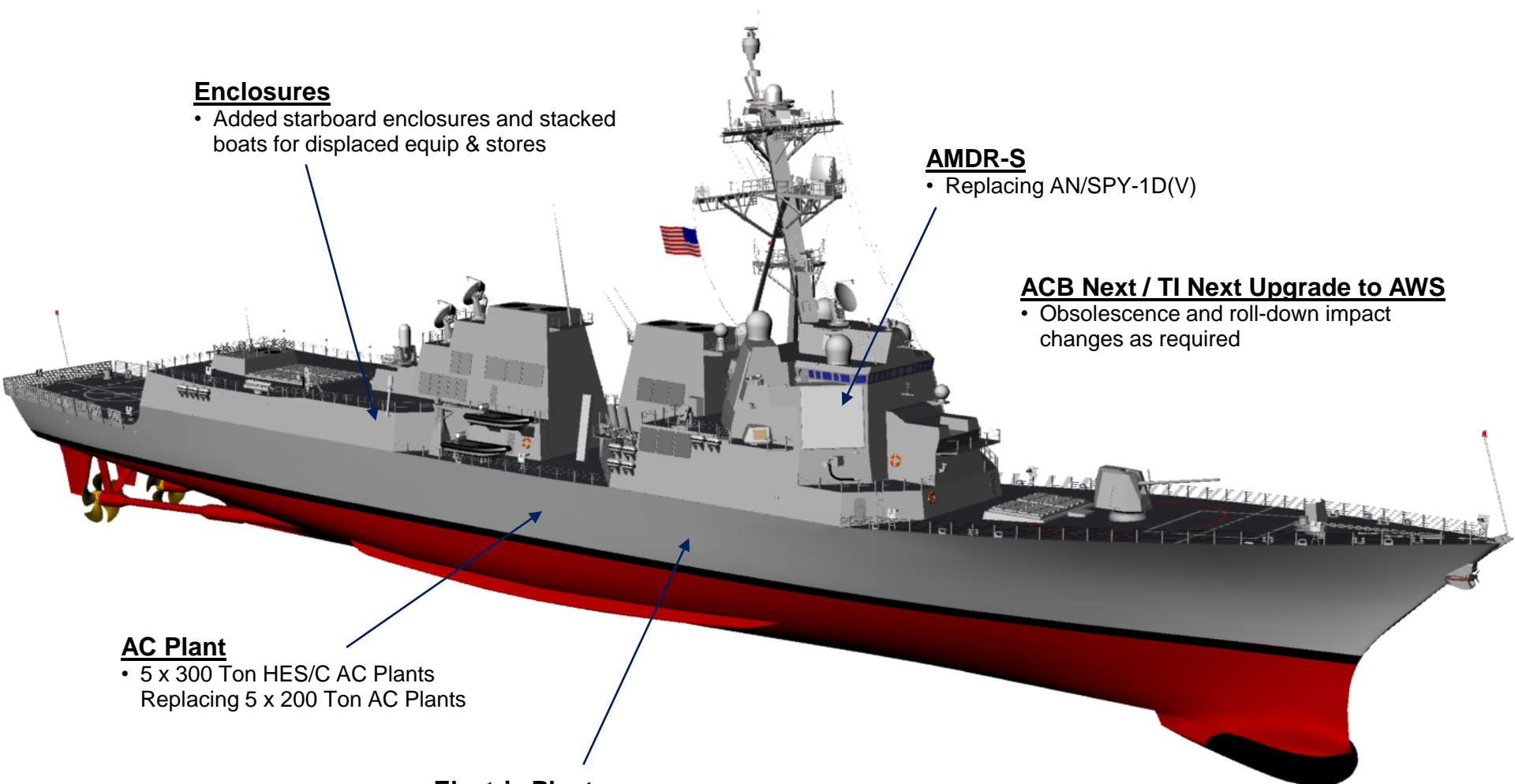
- Obsolescence and roll-down impact changes as required

AC Plant

- 5 x 300 Ton HES/C AC Plants
Replacing 5 x 200 Ton AC Plants

Electric Plant

- 3 x 4MW, 4160 VAC SSGTGs replacing 3 x 3MW, 450 VAC SSGTGs
- Add transformers, PCM, modified switchgear
- Modified controls for MCS and MFMs

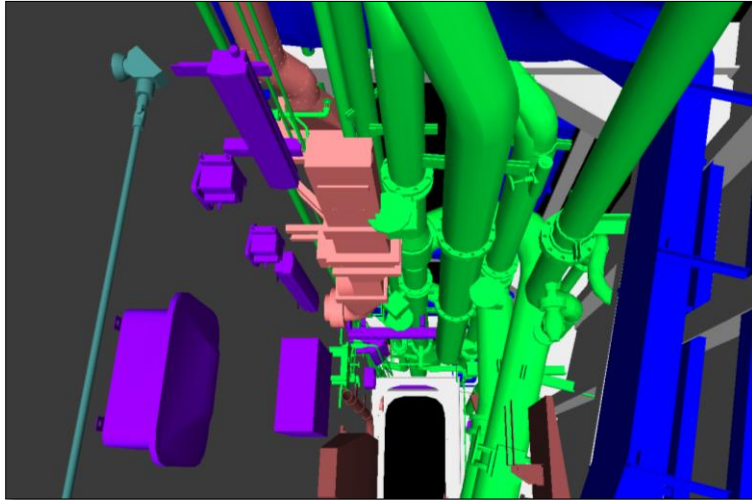




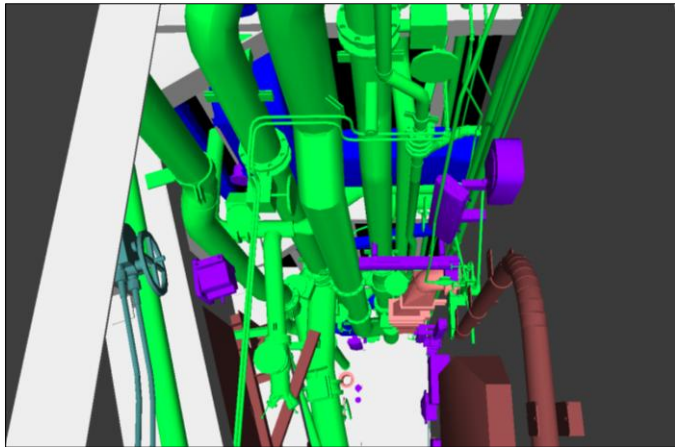
Rapid Reconfigurable Space – Improved Access



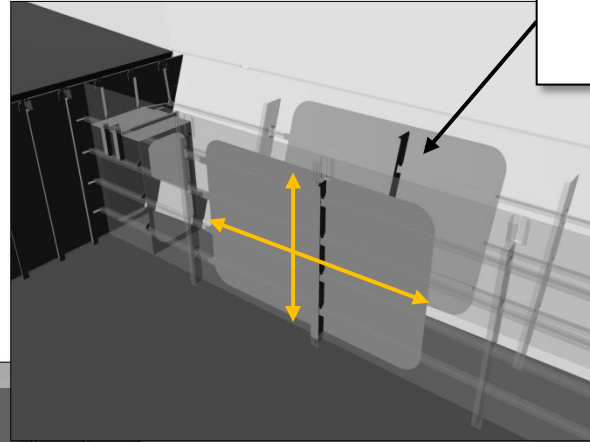
WAS



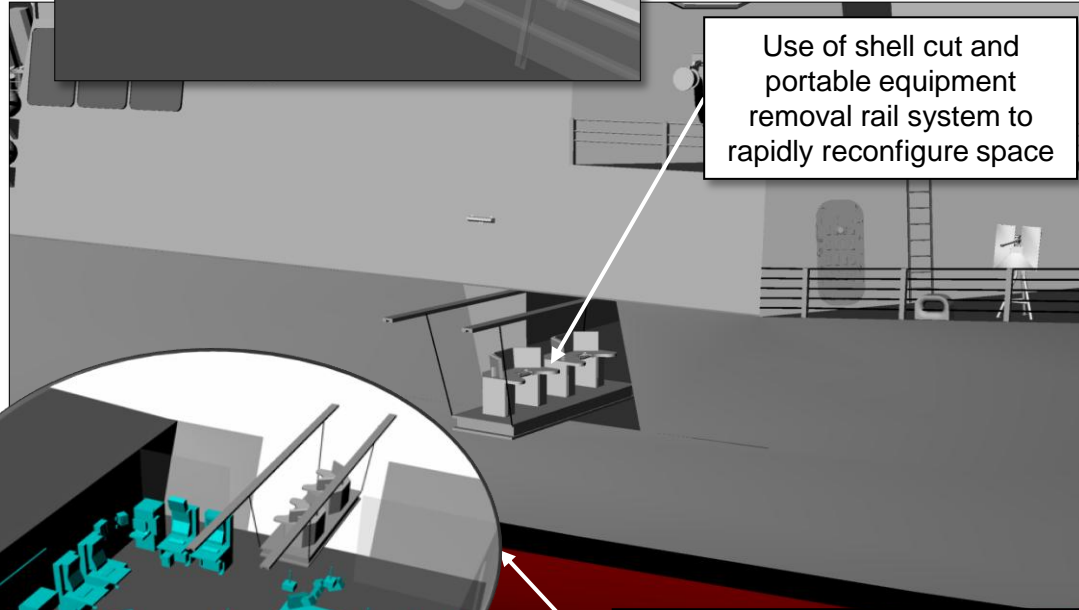
Passages crowded with piping and cabling



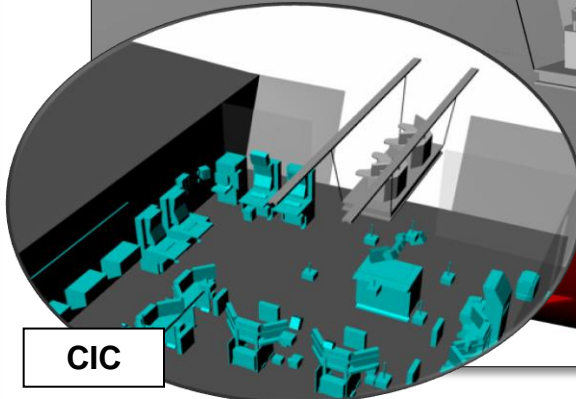
IS



Pre-defined routes allow for clean cutting of shell
Nominally 12 ft x 8 ft



Use of shell cut and portable equipment removal rail system to rapidly reconfigure space

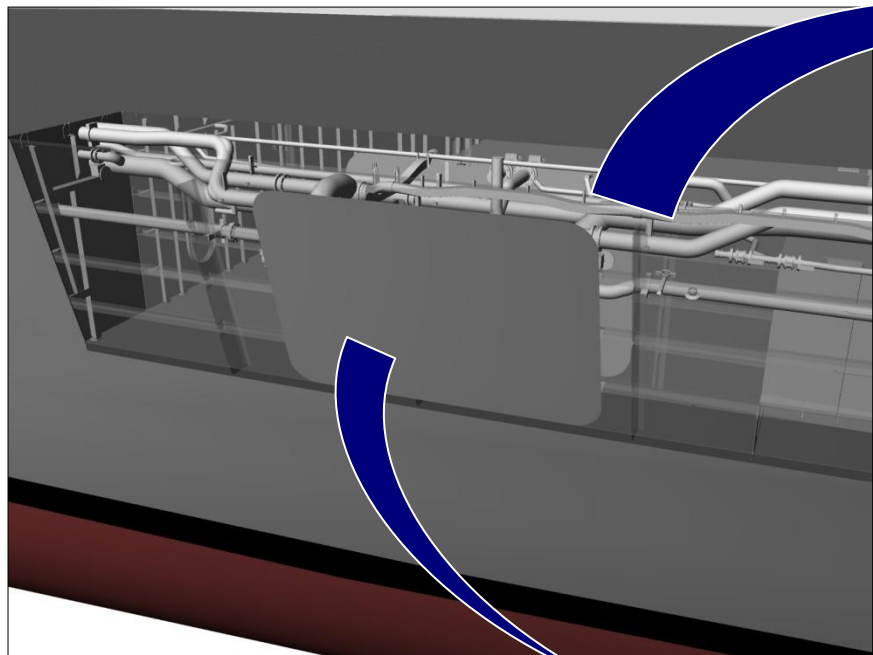


CIC

Pre-defined removal route to avoid cutting of piping and electrical systems



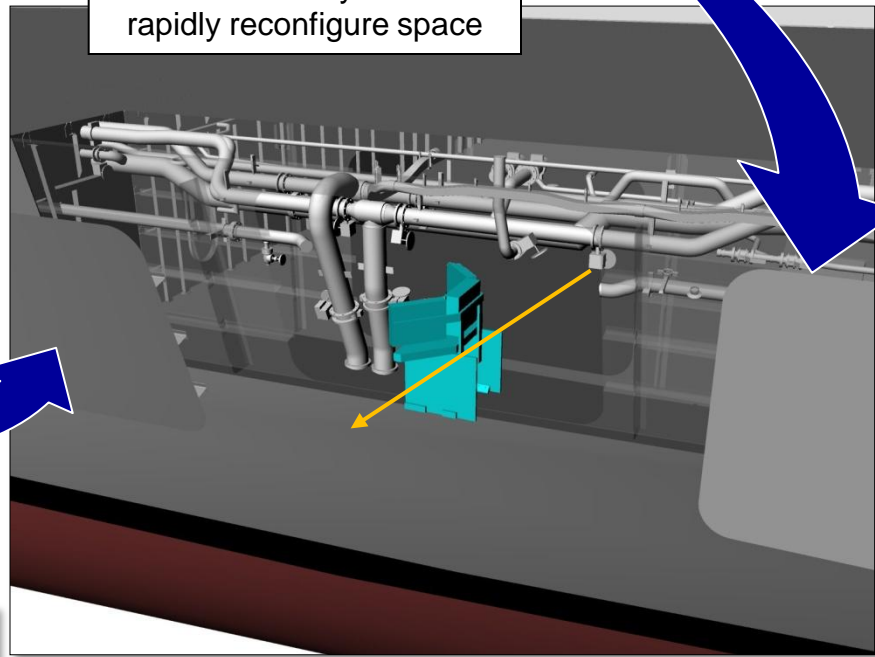
Improved Planned Shell Cuts Typical Detail - WERP



Pre-defined routes allow for clean cutting of shell
Nominally 12 ft x 8 ft

Routes are located in areas to minimize impacts and rework to piping and electrical systems

Use of shell cut and portable equipment removal rail system to rapidly reconfigure space

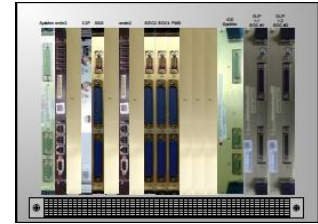
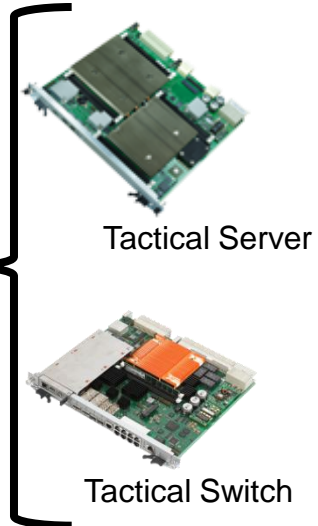




TI 16 Equipment Suite Common Component Building Blocks



Tactical Server Chassis
IPMI Dual Star Bus
SNMP On Line



VMEbus Chassis
Legacy ORTS Bus
SBCs – SNMP



3U Server
IPMI
SNMP On Line



Storage Controller and Expansion
SNMP



1U Server
IPMI
SNMP On-Line



Core Switch
SNMP



DC Power Distro
SNMP



Remote Access Server
SNMP



Edge Switch
SNMP



IP Power Control
Polled Serial Status



System Monitor
SNMP



Thoughts on Risk



- **Normally “bucketed” into three types:**
 - Cost, Schedule, Quality (or Performance, Payload, ??)
- **Cost – easy to measure (a dollar means the same thing to everyone)**
- **Schedule – easy to measure (we all have the same calendar)**
- **Quality - Much harder to measure!**
 - A broad category of program outcome tied around the question “How much will the end user like this product?”
 - Usually, but not always, tied to parameters in a requirements document
 - Often highly dependent on expert opinion to evaluate risk in this area
 - Not Always – modeling and simulation keep getting better
- **There is a “Fourth Risk”!**
 - I refer to it as “Stakeholder Risk”
 - Based on the question “What actions might key stakeholders take that could impact the program?”