The U.S. Government Shipbuilding Industry

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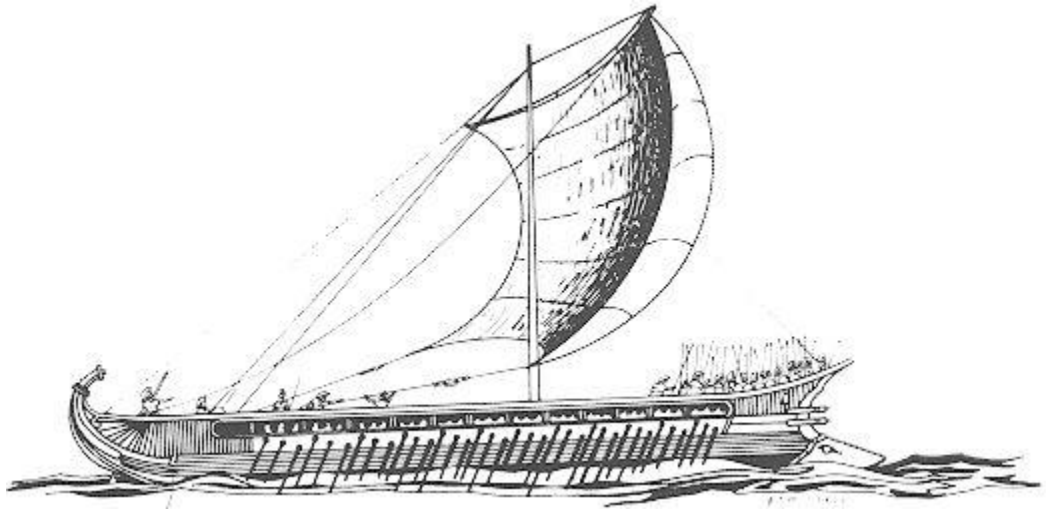
Objectives

- This course will provide an overview of:
  - A typical Government acquisition process
  - Government ship specifications
  - Typical standards employed
  - Some national and international requirements; and
  - Classification Society options for Government assets

Introduction – Beginnings of Naval Ship Design

- Principally, parallel processes were used between naval and commercial ship construction
  - Some notable exceptions of ships designed and built specifically for purposes of warfare and military needs:
    - 480 BCE - Greek Triremes (Salamis)
    - 16th Century - Spanish Armada
    - 18th-19th Centuries - British Empire's Royal Navy
- Throughout most of world seafaring history, the commercial shipbuilding industry often led technology
  - Economic incentives provided by owners
  - Expanding spheres of influence:
    - Regional markets
    - National markets
    - International markets
  - Competition



Source: (1984) Ancient and Medieval Warfare: The History of the Strategies, Tactics, and Leadership of Classical Warfare (Public Domain)

Ancient Era

- Maritime history is thousands of years old, dating back to the arrival in the oceanic islands.
- The earliest recorded instances of maritime seafaring is with the ancient Egyptians.
- Ancient Egyptians had knowledge of sail construction and used to develop vessels for both commercial and military use
  - The earliest warships made with, could carry 10 to 17 catapults and were manually rowed
  - The earliest trading vessels would travel through the Mediterranean, exporting gold, papyrus, and more.
- Later, these practices were adopted and made a professional industry by the Minoans of Crete between 2000 and 1500 BCE.

Ancient Era Cont.

- Figure A depicts an image of the earliest known trading and fishing vessels
- Figure B is a rendering of a navy vessel for Ramses III
  - Early navy history is extensive and recorded some of the earliest naval battles
  - The longevity of the culture is credited in part to their development of naval warfare
- Figure C shows the trading routes established by the Minoans through the Mediterranean

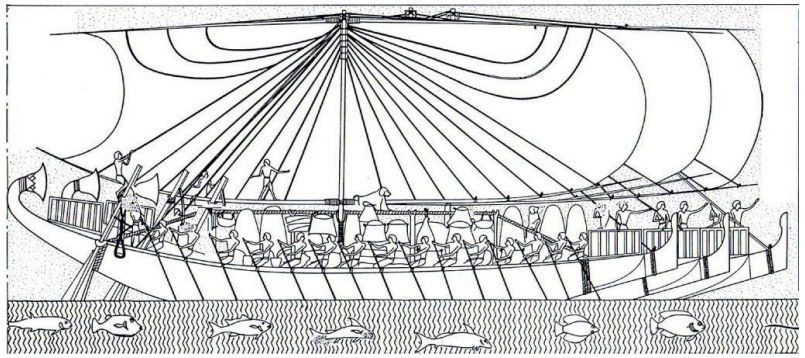


Figure: Ancient Egyptian Trading Vessel

Figure: Ancient Egyptian Navy Vessel

Figure: Minoan Trade Routes

Ancient Era Shipping Cont.

- As the ancient era progressed several other societies took part and later expanded the same trade routes
- Based out of the levant area, Phoenicians were the first after the Minoa to establish trade routes in the Mediterranean and expanded as far as Spain
- The Greeks would end up competing for much of this region near the end of the Phoenician era
- Concurrently, the Carthaginians would also compete in this region, but would also expand their reach from the Nordic countries in the west to the Black sea in the east
- At this end of this era is where we would see the roman empire establish as the dominant force leading into the middle ages

Ancient Era Naval Warfare

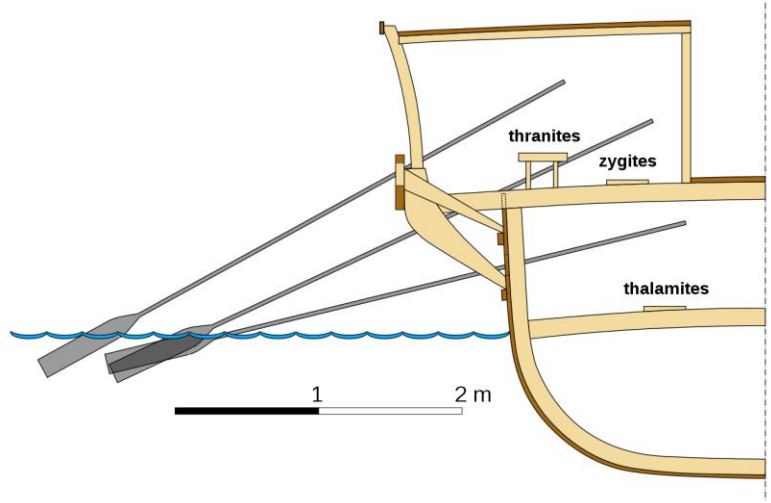
- Historically, control over the sea has depended largely on a society's ability to control by force
- Phoenicians adapted their merchant ship designs to create fighting ships
  - These vessels had two levels of oars and carried soldiers
  - Like the Egyptians, they were also fitting with rams on the bow
- Descendant from Phoenicia, the Carthaginians adopted similar warship designs with the inclusion of mounted catapults for siege warfare

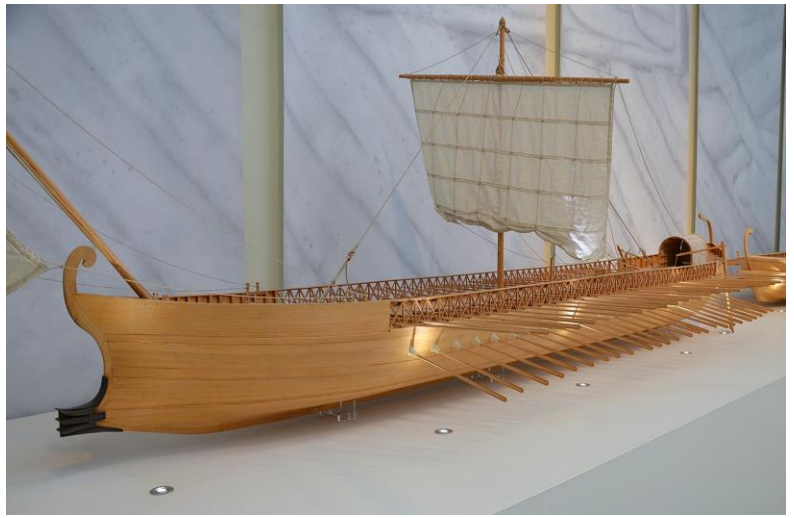
Roman Empire Shipping

- The Roman Empire had a plethora of merchant ships capable to carrying between 70 and 600 tons depending on ship size.
- Merchant ships now resembled what is traditionally seen as wooden cargo ships
- Length to breadth ratio of 3:1, double planked, and ballasted
- Between one and three sails were mounted along with a smaller triangular sail class the supparum at the bow
- Rowers were used as the ship rudders and navigation was done using landmarks, written directions and the pole star

Roman Empire Naval Warfare

- The Roman Navy evolved in its 500 years as part of the empire
- The Navy was mainly composed of –reme type ship which designated how many rows of oars were to be manned per vessel
- The trireme was the oldest type of these utilized in the Hellenistic era, but later quadrireme and quinquereme vessels became the norm as they were big, faster, and performed better in bad weather
- These vessels were unique in that they were designed to not sink when damaged and instead would lay broken on the surface
- They have no ballast, a bronze ram to piece hulls, and were both wind and human powered





Middle Age Shipping

- The middle ages brought an explosion in the development of different designs from every region of the planet
- The people in the Scandinavian regions developed a long boat for shipping cargo known as a Knarr
- The people in the East developed large multi-masted junk ships most famously the treasure ships
- Native Americans developed a light-weight bull boats capable of holding up to a half ton in cargo
- In the west development of larger vessels continued with the Spanish Galleon, the Portuguese Caravel, the Scottish Birlinn, and much more

1860-1870s: A Sea Change

- Economically advantageous to apply empirical methods to commercial design
  - Thus, slowing innovation for cargo ships
- During this same era, the world's navies were experiencing rapidly changing tactics
  - Mission-related objectives become primary drivers for naval design
  - New designs and evolving missions drove navies to return to first principal approaches
    - Empirical thumb rules no longer worked for their evolving designs.
    - Supports the need for specialized naval architecture schools

Example: The Torpedo Boat

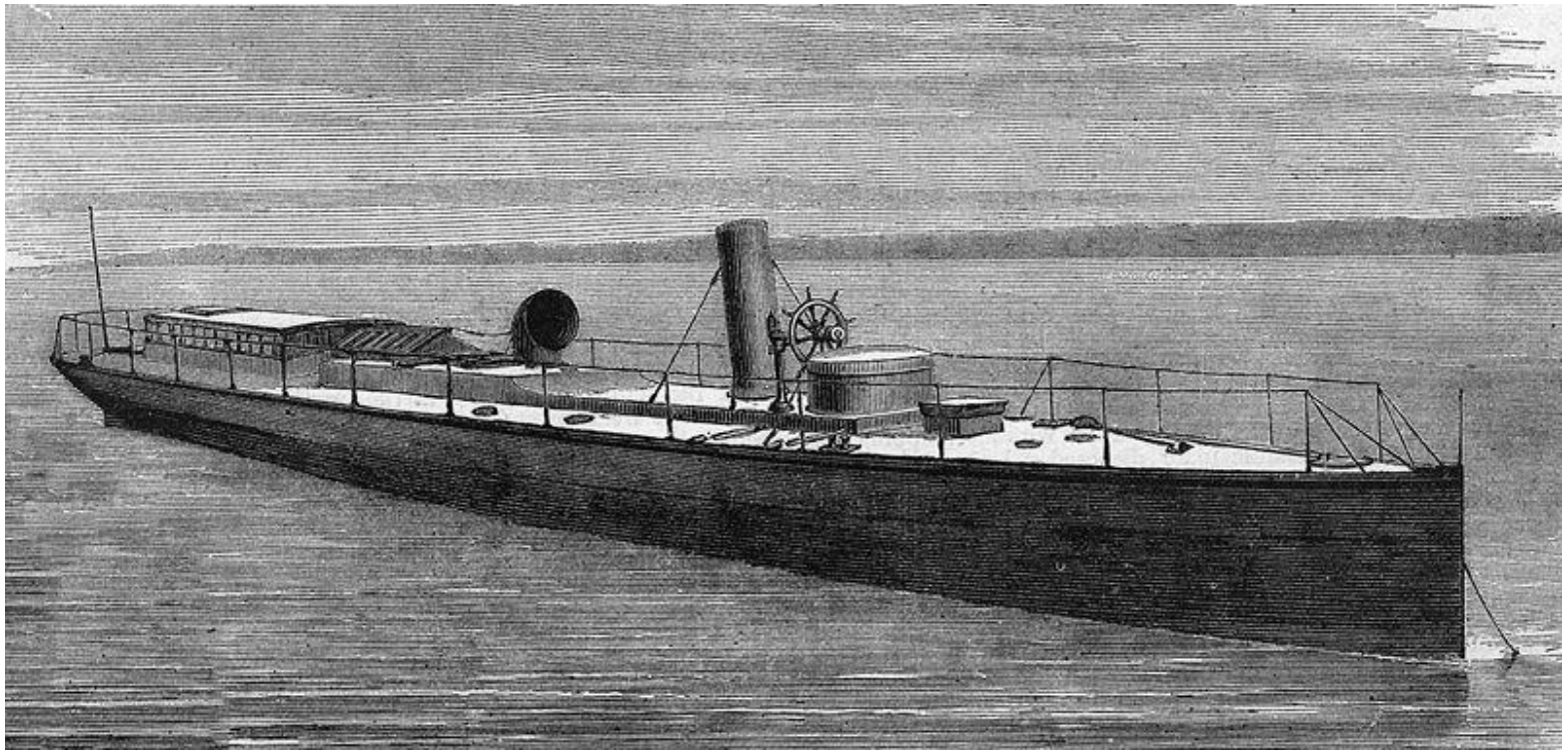
- The self-propelled torpedo (1866) is arguably the most important innovation in sea warfare during the late 19th century and into the 20th century
- Soon after its invention, the torpedo was recognized as a great equalizer of navies.
- Before the torpedo, superior naval power was defined by armor and cannon caliber. After the torpedo, there was a need for additional attributes such as speed and agility.
- The once impenetrable 'ships of the line' (battleships and similar vessels) of a wealthy nation could now be made vulnerable using fast-moving, lightly armored, low, and sleek hulls called torpedo boats.

Example: The Torpedo Boat

- The Torpedo Boat was designed for 1 mission – to disable large capital ships before they can attack an opposing fleet.
- They also helped breed another ship with a specific mission – a ship faster and smaller than a capital ship, with armor to withstand a hit or two, and packing stronger firepower than these new torpedo boats.
- Designated the rather cumbersome term of a 'torpedo boat destroyer', they were soon known simply as 'destroyers'.
- These new designs and evolving missions drove navies to return to first principal approaches – the old empirical thumb rules no longer worked for their evolving designs.
- This also supported the need for specialized naval architecture schools.

Example: The Torpedo Boat

Torpedo Boats (1870s)



HMS Lightning

Source: Scientific American Supplement 7 July 1877 (Public Domain)

The 20th Century

- Naval ship class specialization becomes the norm
- This includes both combatant ship classes such as:
  - Aircraft Carriers
  - Submarines
  - Cruisers
  - Destroyers
  - Frigates
  - Corvettes
- In addition, this would include noncombatants such as :
  - Oilers (tankers)
  - Supply and Stores ships
  - Ship and Submarine Tenders
  - Ammunition Carriers

Rules for Ship Construction - Acquisition

- By the end of the 20th Century, ship design and construction would be included under the more general term of Government Acquisition and codified by the Department of Defense.
- Why have Rules for Acquisition?
  - Standardization – using a common general process
  - Accountability – a consistent way to track programs through:
    - Metrics
    - Milestones
- This reform process would include training for all acquisition personnel

DAWIA (1990)

- The Defense Acquisition Workforce Improvement Act (DAWIA) was passed into law in 1990 to improve the training and education of the Department of Defense's (DoD) civilian and military acquisition workforce.
- The act was a response to studies that found that acquisition workers were undertrained and inexperienced.

DAWIA (1990 - Today)

- DAWIA's goals include:
  - Establishing standards - DAWIA requires the DoD to set standards, requirements, and courses for the acquisition workforce.
  - Certification - DAWIA requires certification for acquisition workforce members, which is achieved by meeting education, experience, and training requirements.
  - Professionalization - DAWIA has helped professionalize the workforce by modernizing the certification framework and shifting training resources.
  - Lifelong learning - DAWIA encourages a culture of lifelong learning for acquisition professionals.
- The DoD has updated DAWIA certification standards, and the changes took effect on February 1, 2022.

DOD INSTRUCTION (DODI) 5000.02

- Title: OPERATION OF THE ADAPTIVE ACQUISITION FRAMEWORK
- Originator: Office of the Under Secretary of Defense for Acquisition and Sustainment
- Release Date: January 23, 2020 (Change 1 Approved June 8, 2022)

DoD INSTRUCTION 5000.02

OPERATION OF THE ADAPTIVE ACQUISITION FRAMEWORK

Originating Component:	Office of the Under Secretary of Defense for Acquisition and Sustainment
Effective: **Change 1 Effective:**	January 23, 2020 June 8, 2022
Releasability:	Cleared for public release. Available on the Directives Division Website at https://www.esd.whs.mil/DD/.
Reissues and Cancels:	See Paragraph 1.4.
Approved by: **Change 1 Approved by:**	Ellen M. Lord, Under Secretary of Defense for Acquisition and Sustainment William A. LaPlante, Under Secretary of Defense for Acquisition and Sustainment

Purpose: In accordance with the authority in DoD Directive (DoDD) 5135.02 and the December 20, 2019 Deputy Secretary of Defense (DepSecDef) Memorandum, this issuance:

- Establishes policy and prescribes procedures for managing acquisition programs, pursuant to the relevant sections of Title 10, United States Code.
- Assigns acquisition program management responsibilities in accordance with the authority in DoDDs 5135.02, 5137.02, and 5000.01.
- Describes the responsibilities of principal acquisition officials and the purpose and key characteristics of the acquisition pathways.
- Restructures defense acquisition guidance to improve process effectiveness and implement the Adaptive Acquisition Framework (AAF). As a result of that restructuring, this issuance has been renamed "Operation of the Adaptive Acquisition Framework," to better reflect the current content.

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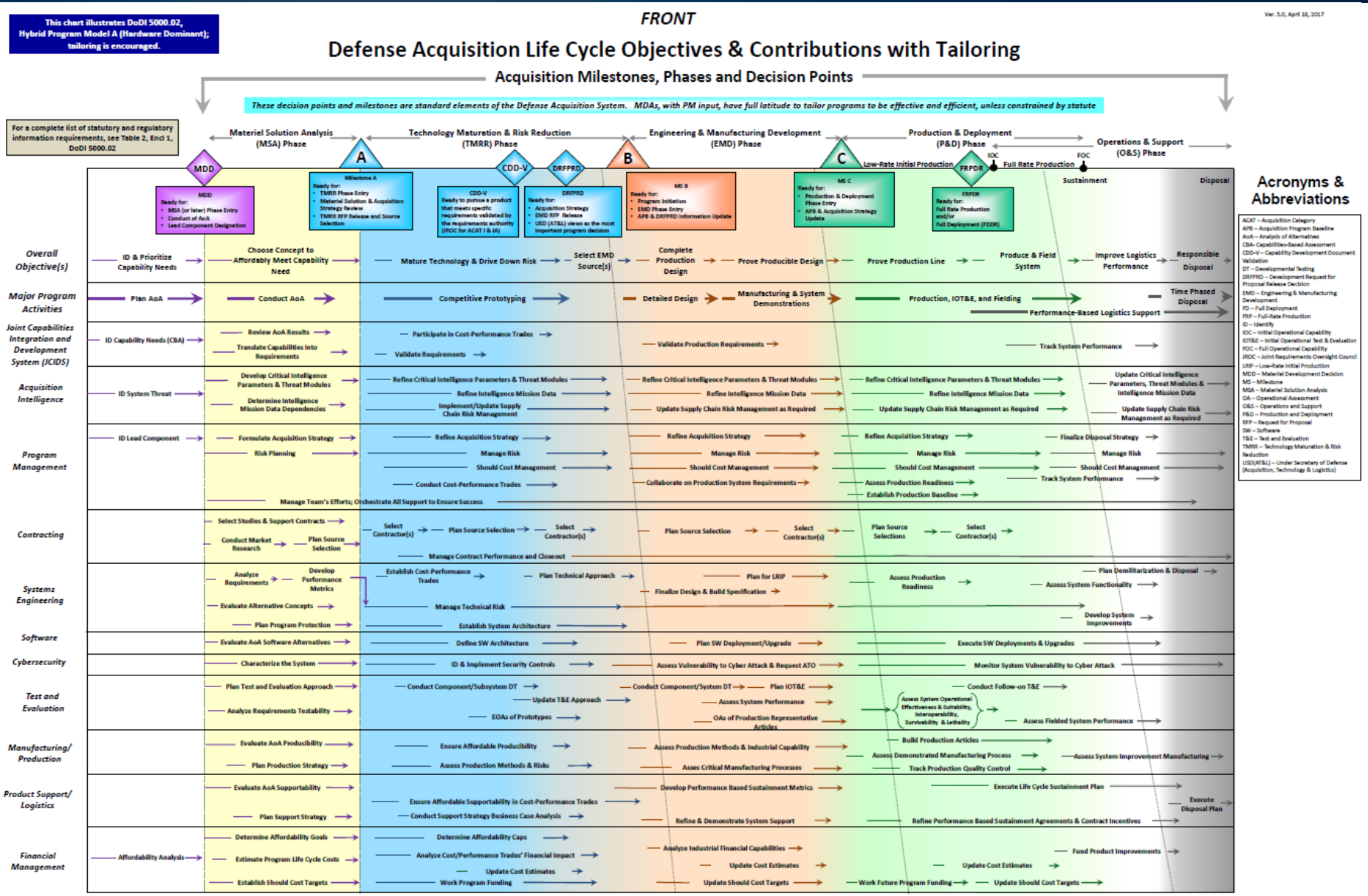
DOD INSTRUCTION (DODI) 5000.02 (Front)



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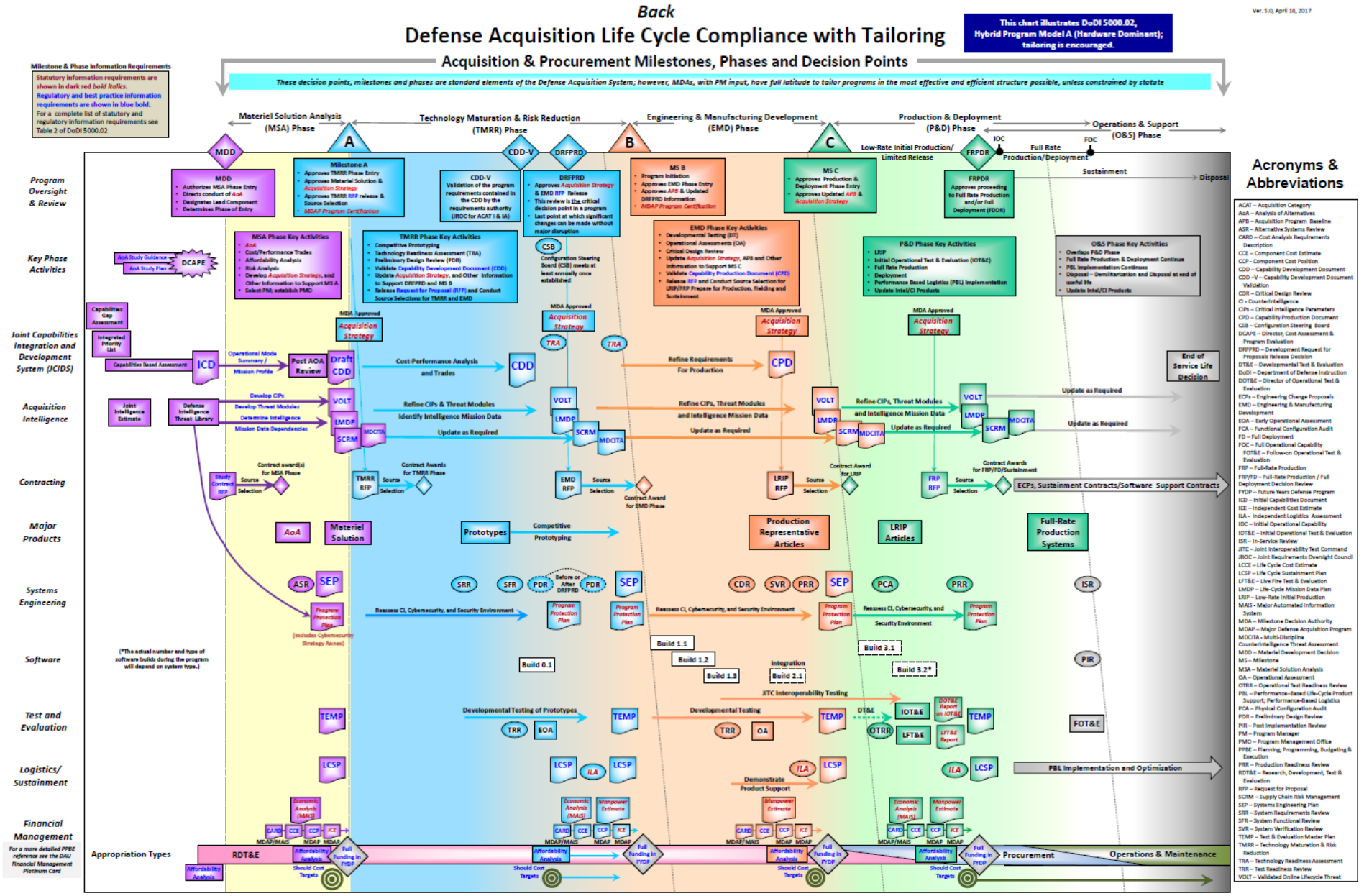

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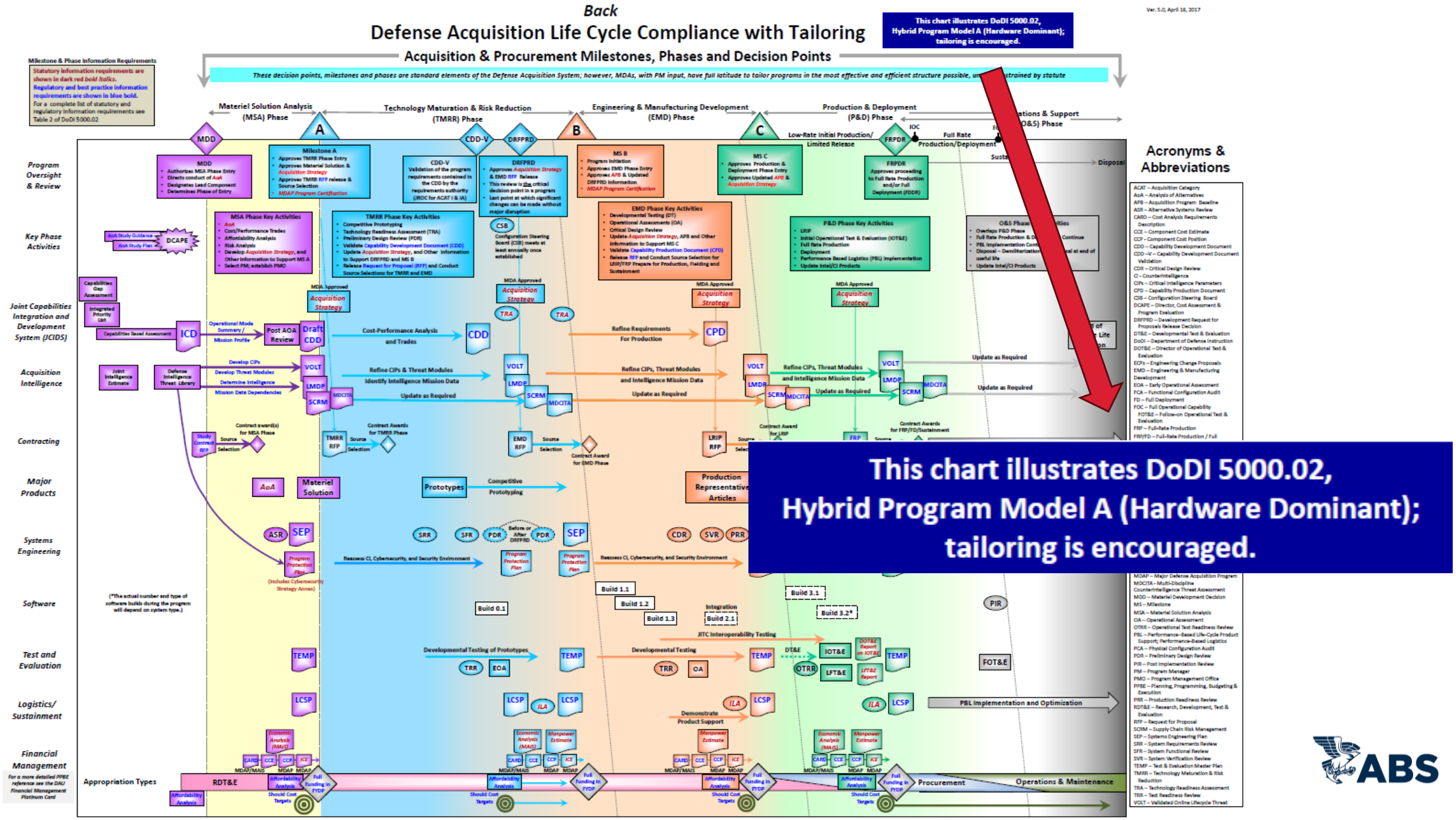
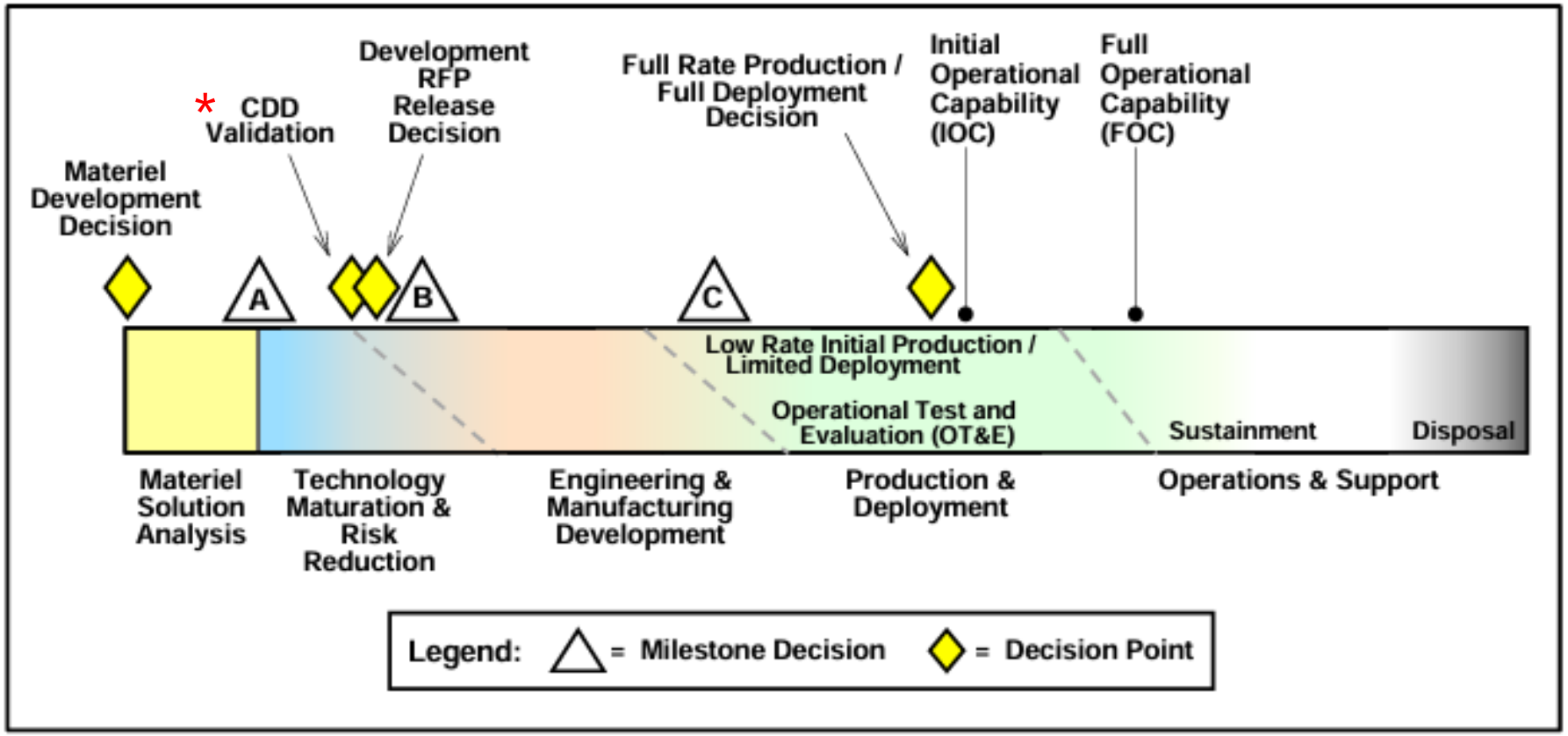
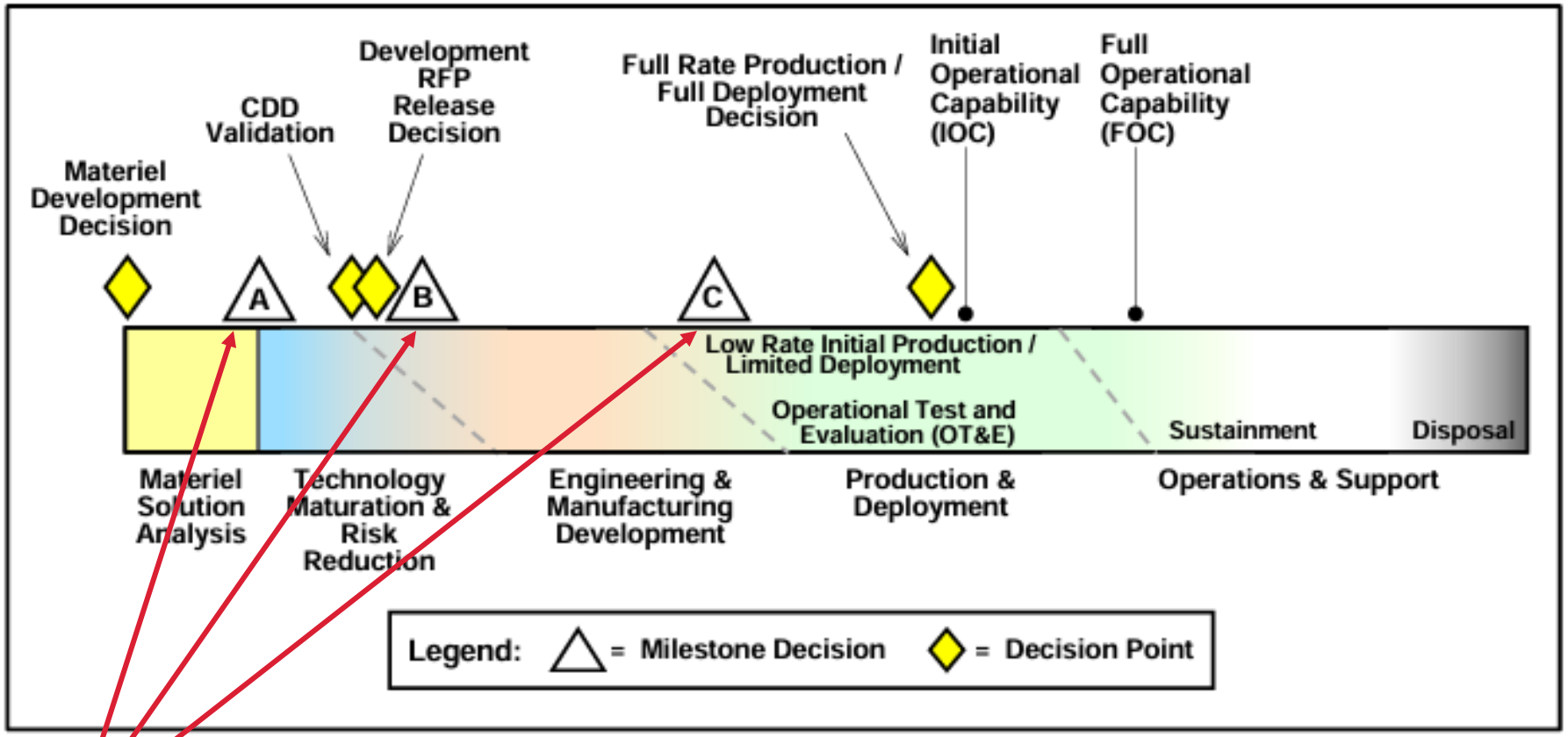


Major Capability Acquisition Model



* Capability Development Document (CDD) is a document in the US Department of Defense's (DoD) Defense Acquisition System that specifies the requirements for a new system. The CDD is system-specific and applies to a single increment of capability in an evolutionary acquisition program.

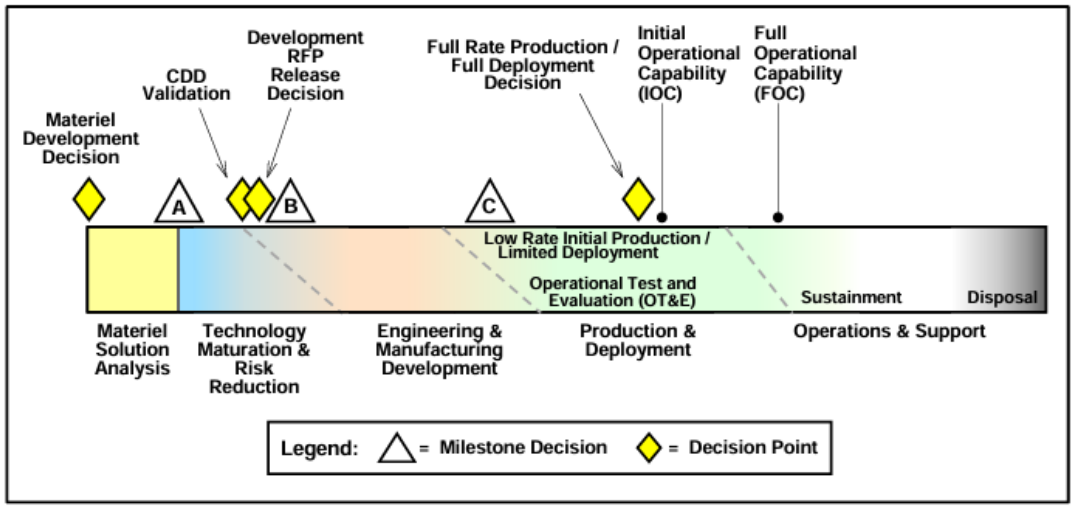
Major Capability Acquisition Model



Milestones

Milestones

- Milestones are a point in time when a recommendation is made to the Milestone Decision Authority (MDA) about starting or continuing an acquisition program into the next Acquisition Phase.
- The milestones and their requirements are established by DoDI 5000.02, “Operation of the Defense Acquisition System”
- The milestones are represented by triangles (Δ) with the letters A, B, or C inside them in the figure below.



Milestone Development

- Milestone A - New acquisition program approval
  - The first phase of system development is concept refinement, and it culminates in Milestone A.
- Milestone B – Defined system design
  - The second phase, technology development, ends in Milestone B, at which stage a well-defined system design has been agreed on for addressing an identified need.
- Milestone C – Authorizes start of production
  - The third phase of development is system development and demonstration. Once the system design is verified using developmental testing and appropriate operational assessments, Milestone C authorizes production of prototypes that are likely to satisfy the operational requirements.

Common Milestone A Requirements

- Analysis of Alternatives (AoA) Identified Solution
- Cost Estimate
- Approved Initial Capabilities Document (ICD)
- Draft Capability Development Document (CDD)
- Technology Development Strategy
- Technology Readiness Assessment
- Technology Development Roadmap
- Test & Evaluation Strategy

Common Milestone B Requirements

- Approved Capabilities Design Document (CDD)
- Acquisition Strategy
- Benefits Analysis and Determination
- Competition Analysis
- Supportability Analysis
- Test & Evaluation Master Plan (TEMP)
- Low-Rate Initial Production (LRIP) Quantities

Common Milestone C Requirements

- Low-Rate Initial Production (LRIP) Determination
- Capability Production Document (CPD)
- Production and Deployment Phase contract awarded

Production

- Following Milestone C, production verification testing as well as other tests are carried out. It concludes with operational testing and evaluation in support of the decision to enter into full-rate production (FRP).
- Passing the operational test generally promotes the system to full-rate production and deployment (fielding).
- The last phase of acquisition is operations and support, which includes maintenance of production, system support in the field, and any follow-on product improvements and any additional operational testing and evaluation that is needed.

Specifications

- While progressing through these milestones, the ship specification is being developed.
- Generally, specifications follow 2 general formats:
  - Detail Specifications
  - Performance Specifications

Detail Specifications

- For most of the 20th Century, the US Navy has employed the use of Detail Specifications for ship construction.
- In general, a detail specification in the US Department of Defense (DoD) is a document that outlines design requirements for items, such as how they are to be constructed, the materials used, and how to achieve requirements.
- Detail specifications can include both performance and detail requirements but are still considered detail specifications.
- Today, it is DoD policy to state requirements in terms of performance, but detail specifications are not prohibited and can sometimes be the best solution.

Performance Specifications

- A **Performance Specification** states requirements in terms of the required results with criteria for verifying compliance, but without stating the methods for achieving the required results.
- A Performance Specification defines the functional requirements for the item, the environment in which it must operate, and interface and interchangeability characteristics.
- Documents addressing Performance Specification policy and guidance have been issued:
  - MIL-STD-961E(1) NOT 1, Defense and Program-Unique Specifications Format and Content, dated 10 March 2010.
  - Specific guidance on the development and use of performance specifications appears in the SD-15, Guide for Performance Specifications, dated 24 August 2009.

Organization of Specifications (Example)

- **Example:**
  - The Dewey Decimal Classification System is used for cataloging and organizing books in libraries throughout the U.S.
  - The system using the same basic numbers, regardless of which library you enter:
    - 000 – Computer science, information and general works
    - 100 – Philosophy and psychology
    - 200 – Religion
    - 300 – Social sciences
    - 400 – Language
    - 500 – Pure science
    - 600 – Technology
    - 700 – Arts and recreation
    - 800 – Literature
    - 900 – History and geography

Organization of Specifications - ESWBS

- Likewise, the organization of Government Specifications is important, in that it allows the many ship construction participants a common roadmap
- Typically, Government Specifications are organized using ESWBS
  - ESWBS: **Expanded Ship Work Breakdown Structure**
- ESWBS provides a method to integrate design, configuration, and logistics standard coding of the breakdown structure for different ships, such as aircraft carriers, submarines, surface combatants, and associated ship systems.
- ESWBS provides an indentured listing of all systems, subsystems, equipment, and components with the highest level of indenture defined along major functional lines.

ESWBS Functional Groups

- Like the Dewey Decimal Classification System, ESWBS uses a basic numbering approach:

ESWBS group number	Functional group nomenclature
100	Hull structure group
200	Propulsion plant group
300	Electrical plant group
400	Command and surveillance group
500	Auxiliary group
600	Outfit and furnishings, general
700	Armament group
800	Integration/engineering

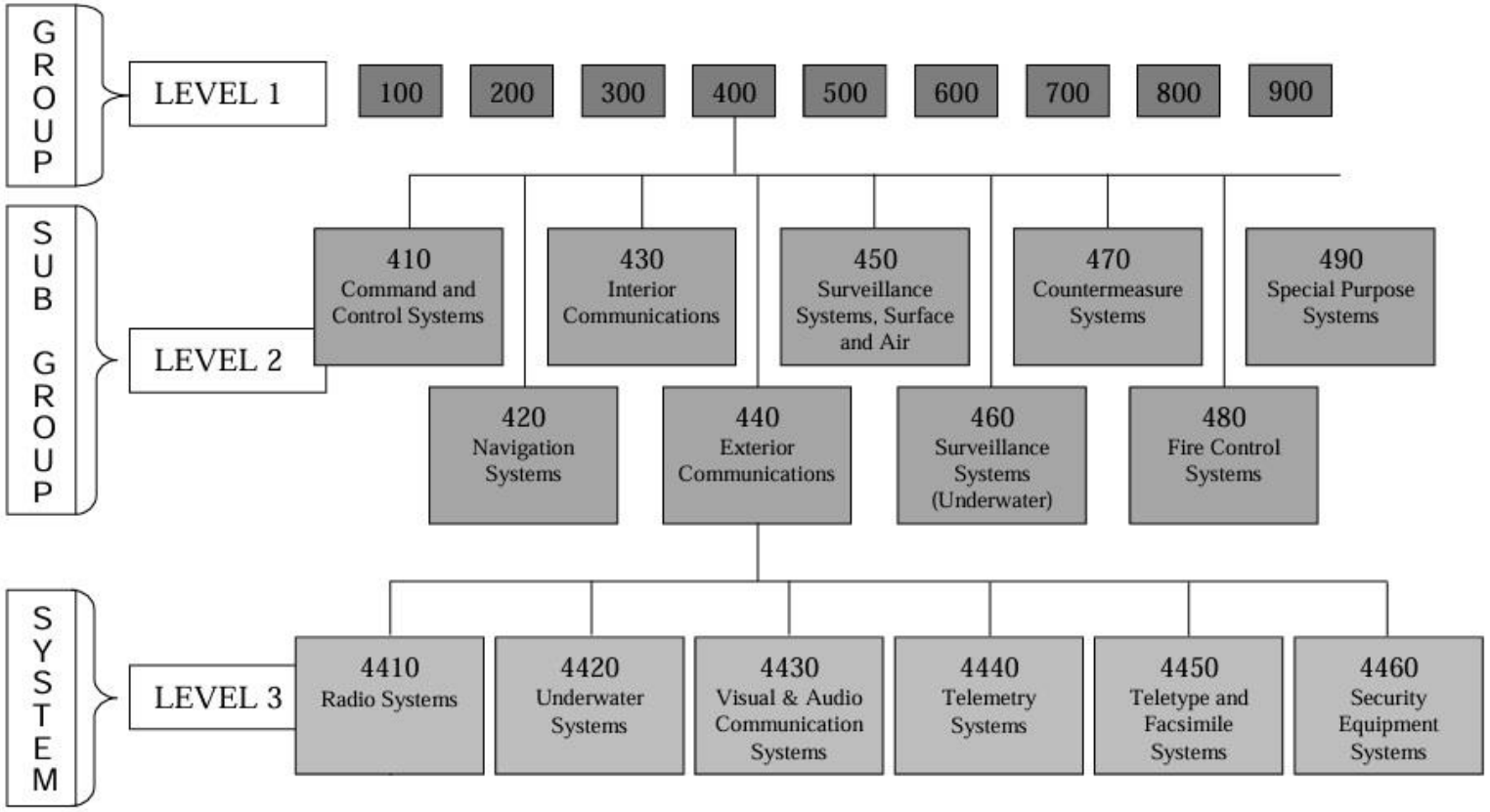
ESWBS Functional Groups

- Successive levels of indenture break each major functional group into major sub-groups (ESWBS Level II), systems (Level III), and subsystem/component boundaries (Level IV and lower).
  - However, specifications generally only break down to the level III (system) category.

ESWBS indenture level	ESWBS number	ESWBS nomenclature
Level I	400	Command and surveillance, general
Level II	440	Exterior communications
Level III	441	Radio systems
Level IV	4413	T-1322()/SRC Communications Transmitter
Level V	44131	AM-6675/URT Amplifier

ESWBS Categories

- Example of an ESWBS breakdown to Level III:



000 – General Guidance and Administration

- One additional ESWBS Category is the 000 Group
  - 000 – General Guidance and Administration
- The Subgroups and Systems within the 000 Group provide the foundational, fundamental requirements for the ship
- Of particular importance in this Group are:
  - 042: General Administrative Requirements
  - 070: General Requirements for Design and Construction
  - 094: Ship Trials
  - 095: Ship Testing

042 – General Administrative Requirements

- Requirements found in Chapter 042:
  - Definitions
  - General Requirements
    - Description of design and construction documents
      - Specification
      - Contract plans
      - Arrangements and details
    - Description of governing organizations and reference standards used
    - Order of precedence of requirements
    - Any clarifications needed

070 – General Requirements for Design & Construction

- Requirements found in Chapter 070:
  - General and Detailed Design Requirements
    - Mission requirements
    - Parameters such as speed, general dimensions and tonnage
    - Range and endurance
    - Accommodations
    - Environmental Conditions
    - Service Life
    - Seakeeping and Maneuverability
    - Watertight Integrity and Survivability
    - Etc.

070 - General Requirements for Design & Construction

- *(Continued)* Requirements found in Chapter 070:
  - Regulatory and Certification Requirements
    - These can be DOD based, such as:
      - Approval of Navy organizations such as:
        - * SUPSHIP and * INSURV
        - Naval Air Systems Command (NAVAIR) certification for helicopter facilities
        - Certification to other military documents (to be covered)

* SUPSHIP - Supervisor Of Shipbuilding, Conversion And Repair

* INSURV – Board of Inspection and Survey

070 - General Requirements for Design & Construction

- *(Continued)* Requirements found in Chapter 070:
  - Regulatory and Certification Requirements
    - They can also be standards published through Governmental or Commercial organizations such as:
      - International Maritime Organization (IMO)
      - US Federal Communication Commission (FCC)
      - Panama Canal Commission (PCC)
      - Classification Societies
      - Etc.

094 & 095 - Testing

- 094: Sea Trials
  - All requirements for the vessel to demonstrate during dock trials and sea trials
- 095: Ship Testing
  - All requirements to be demonstrated during system and equipment testing

Standards Incorporated into Specifications

- Military and Government Documents
  - “MIL-STD” and “MIL-SPEC” are “mil-speak” for military standards and military specifications that define thousands of products and processes across the Defense Department.
  - Military specifications describe a product’s physical or operational characteristics, and military standards detail the processes and materials used to make it.
  - Both serve as a common language among military organizations to promote interoperability and reliability.

Standards Incorporated into Specifications

- Military and Government Documents
  - Military standards set and communicate standards on how things are to be designed, built and tested in a controlled, known and acceptable manner so that all who bid on contracts know exactly what is expected of them to be successful and competitive.
  - Other Government Documents include:
    - Defense specifications, standards, and handbooks
    - Federal specifications and standards
    - Guide specifications, and
    - Commercial item descriptions

Standards Incorporated into Specifications

- Responsible Organizations
- Defense Logistics Agency
  - DLA manages around 12,500 of more than 27,000 active departmentwide documents
- Defense Standardization Program
  - Identifies, influences, develops, manages, and provides access to standardization processes, products, and services for warfighters, the acquisition community, and the logistics community to promote interoperability, reduce total ownership costs, and sustain readiness.

Types of DSP Documents

- The term "DSP document" refers to any document described in DoD Manual 4120.24, Defense Standardization Program Procedures, and indexed in * ASSIST.

* Acquisition Streamlining and Standardization Information System

Types of DSP Documents

- Types of Documents:
  - **Defense Specifications:**
    - Essentially product descriptions.
    - 2 major types of specifications: performance specifications (MIL-PRF-) and detail specifications (MIL-DTL-).
    - Detail specifications in an active or inactive status published prior to June 1994 that haven't been revised since may still begin as MIL-A-, MIL-B-, MIL-C, etc.

Types of DSP Documents

- Types of Documents:
  - **Defense Standards:**
    - Commonly referred to as MIL standards.
    - 5 different types: standard practices, interface standards, design criteria standards, test method standards, and manufacturing process standards.
  - **Data Item Descriptions**
    - Standardization document that defines the data required of a contractor.
    - The document specifically defines the data content, format, and intended use.

Types of DSP Documents

- Types of Documents:
  - **Federal standards, federal specifications, and commercial item descriptions**
    - The Federal Acquisition Services within the General Services Administration (GSA/FAS) publishes the procedures governing these categories of documents in the Federal Standardization Manual.
    - Commercial item descriptions are simplified specifications that describe commercially available items.
    - Federal specifications usually begin with one, two, or three alpha characters, followed by a dash, another alpha character, another dash, and then a number. CIDs always begin with the designation A-A- followed by a unique number.

Finding DSP Documents - ASSIST

- ASSIST (Acquisition Streamlining and Standardization Information System)
  - The official source for the most current defense standardization documents.
  - Web-based application that serves as the DoD's official source for DSP documents developed, maintained, and used by DoD.
  - Visit ASSIST at https://assist.dla.mil

Types of DSP Documents

- Types of Documents:
  - **Non-government Standards (NGS)**
    - Non-government standards are developed, established, coordinated, and approved by private sector organizations with wide membership using a consensus process.
    - Except when inconsistent with law or otherwise impractical, section 12(d) of Public Law 104-113 requires that federal agencies use NGSs in lieu of government specifications and standards.

Moving Towards Commercial Standards (NGS)

- Acquisition Reform
  - Defense Secretary William Perry 1994 Memorandum
  - LPD 17 (San Antonio class)
    - Test case for acquisition reform initiatives
    - Ship specification reduced from approximately 1,700 military standards cited to less than 300
    - US Navy realized a great deal of useful commercial standards exist
    - Recognized a need to get involved in the many organizations creating them

Moving Towards Commerical Standards

- Over time, DOD has shifted from military to commercial standards to lessen reliance on formatting unique to the government, with DOD participating in developing those non-governmental standards.

Military example: Marking of electrical and electronic parts

Military Standard MIL-STD-1285D

There are standards for marking electrical parts. From the standard:

"Functional and part identification marking shall be applied in the location specified in the acquisition document. Where size, surface condition, or other design considerations will not allow marking in accordance with either method I or II, the acquisition document shall specify the method of application (unit package, tag, or label), and the exact marking requirements. Special marking (caution warnings, radioactive) also shall be as specified in the acquisition document."

Source: DLA

Moving Towards Commerical Standards

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Commercial example: Cookies

Commercial Standard A-A-20295

Some standards are adapted from commercial standards. The humble chocolate chip cookie has a standard:

"The cookies shall have a distinct chocolate flavor typical of the flavor specified. The cookies shall have a tan to medium brown color. The cookies shall have a uniform distribution of chocolate chips and when applicable nuts, chocolate chunks, peanut butter chips, pan coated candy, peanut butter cups, and chocolate-covered-crunchy-peanut-butter candy. When bake type A is specified, the texture shall be crispy, crunchy, and slightly crumbly, with a firm bite. Bake type A cookies may exhibit some surface cracking. When bake type B is specified, the texture shall be soft and slightly chewy."

Source: DLA

Commercial Standards Organizations

- Governments are trending away from traditional naval design approaches, and towards a baseline centered in common international requirements
- Some examples of a more global approach to design and acquisition:
  - Organizations such as ASTM F25 and ISO TC8
  - NATO (ANEP 77)
  - Classification Society Rules and Guides

International Organization for Standardization (ISO)

- World's largest developer of voluntary international standards
  - Over 25,000 International Standards
  - Members from 172 countries
  - 841 Technical Committees and Subcommittees (as of 2024)
  - About 4000 technical bodies(as of 2024)
  - Some well-known ISO Standards include:

    - ISO 8601: Sets out a universal date-and-time format
    - ISO 9000: Quality management
    - ISO 45001: Occupational health and safety
    - ISO 50001: Energy management
    - ISO/IEC 27000: Information security management

Source: ISO.org

International Organization for Standardization (ISO)

- Starting in the 1990's, the United States increased their involvement in ISO to assist in developing commercial standards useful to both commercial and government programs
  - Partnered with American National Standards Institute (ANSI) to convert US standards into global standards
- Technical Committee 8: Ships and Marine Technology
  - **Scope:** Standardization of design, construction, training, structural elements, outfitting parts, equipment, methods and technology, and marine environmental matters, used in shipbuilding, comprising sea-going ships, vessels for inland navigation, offshore structures, ship-to-shore interface, the operation of ships, marine structures subject to IMO requirements, and the observation and exploration of the sea.

Source: ISO.org

American Society for Testing Materials (ASTM)

- Produces standards successfully applied to a wide range of industries across the US
- Thousands of industry specifications
- ASTM F25 Committee on Ships and Marine Technology:
  - Preeminent standard bodies geared specifically towards US shipbuilding
  - Some standards managed by discipline specific committees such as those for marine electrical applications
  - Volume 01.07

Source: ASTM.org

American Society for Testing Materials (ASTM)

- Gained increased government participation in the 1990s
- Excellent forum for reviewing and comparing of military standards to existing industry standards.
- Added annexes to the standards known as “Supplementary Requirements” for military use.
- Examples:
  - ASTM F683 (Standard Practice for Selection and Application of Thermal Insulation for Piping and Machinery)
  - ASTM F998 (Standard Specification for Centrifugal Pump, Shipboard Use)
- Like ANSI, ASTM F25 standards could also be ‘fast tracked’ into an ISO standard through ISO TC8/SC3

Classification Societies

- Long experience in commercial shipbuilding
- Independent third-party
- Many navies gained familiarity with the class society process through many construction programs involving ships for the navies built to commercial standards:
  - Non-combatant
  - Auxiliary support vessels
  - Government participation in the ABS Technical Committee
- In the 21st Century, class society involvement has included naval combatants in many countries

Classification Societies

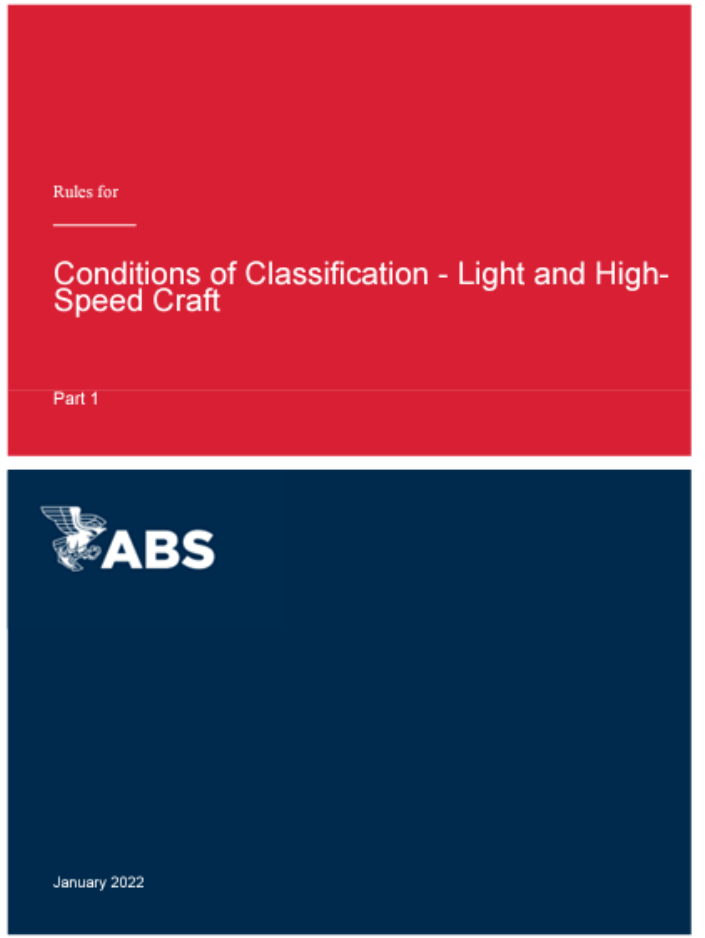
- Navies which have applied the process of classification to some degree for either the acquisition or in-service maintenance of their vessels include:

Australia	Canada	Chile	Columbia
Denmark	Ecuador	Egypt	France
Germany	India	Israel	Italy
New Zealand	Oman	The Philippines	
Saudi Arabia	Singapore	South Africa	
United Kingdom	Spain	United States	

- In the US, the Government is directed per US Code to use ABS as its sole agent for classification or classification-related matters.

Example: Class Society Rules for Government

- ABS Rule Sets for Government Programs
  - Marine Vessel Rules
  - Rules for Building and Classing Light Warships, Patrol and High-Speed Naval Vessels
  - International Naval Ship Guide



Other Class Society Related Efforts – ANEP 77

- 2000: Terms of Reference (ToR) was signed forming the Naval Ship Classification Association (NSCA)
  - Support NATO Maritime Capabilities Group 6
  - NSCA began work on the Naval Ship Code
- 2008: International Naval Safety Association (INSA) established
  - Open forum between the NSCA and interested navies
- Naval Ship Code (NSC) (ANEP 77)
  - Cost-effective goal-based standard that determines a minimum level of safety for naval ships
  - Accepted by many in the global naval community and intergovernmental bodies
  - Published by NATO as ANEP 77

ANEP 77

- “Goal-Based” Standard
  - Considers what the ultimate safety objective of the designer might be
  - Range of alternative design approaches to reach goal
- INSA Participants – Navies:
  - Royal Australian, Canadian, Danish, French, Italian, Netherlands, Norwegian, Polish, South African, Swedish and UK (Royal Navy)
- INSA Participants – Class Societies:
  - ABS, BV, DNV, GL, HR, LR, PR, RINA and TL

Conclusion

- Government Shipbuilding follows a prescribed process using the more generic model know as Government Acquisition
- The old model, which employed the sole use of Government and Military Documents Standards, has evolved over time
- Governments and navies have come to recognize that they can no longer afford to isolate themselves from the potential technical and process advantages available in commercial standards organizations.
- Today, most government shipbuilding programs employ a mix of both military and commercial standards.
- Many navies are continuing to seek the right balance between:
  - Appropriate naval control and oversight of an acquisition program, with
  - Integration of existing successful commercial standards and processes, which hold the promise of cost reduction and introduction of commercial technical advancements.

Thank You

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