NAVAL SHIP CODE

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- Involved with the development of the code since the start 2005

Naval Ship Code

- The Naval Ship Code (NSC) is a goal based standard that determines a minimum level of safety for Naval Vessels. It is the formal document published by NATO (as ANEP77) which includes the Code and supporting Guide.
- The current version is Edition 4 released in December 2012

Goal based approach

11 For the development of the Naval Ship Code, a hierarchy of tiers has been adopted as shown in Figure 1. The increasing width of the triangle as the Naval Ship Code descends through the tiers implies an increasing level of detail.

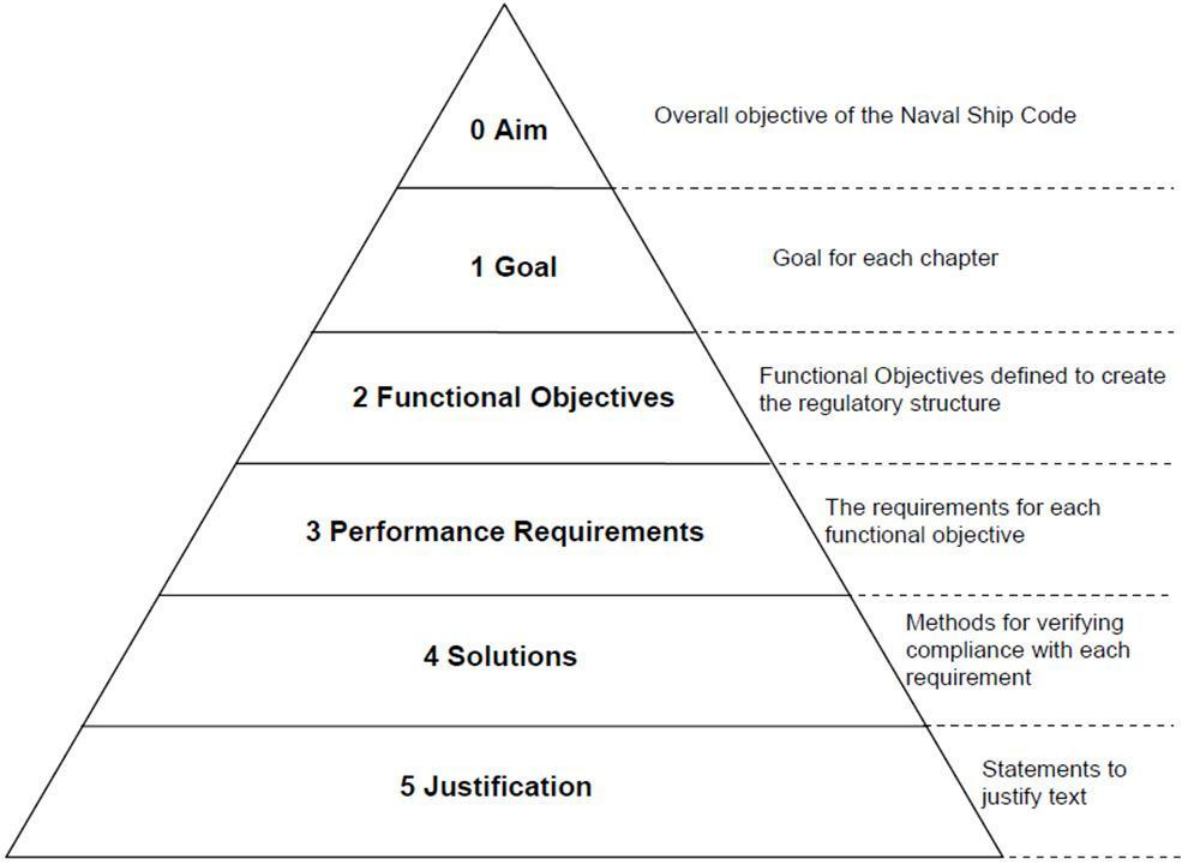

Figure 1: Goal Based Approach to Developing the Naval Ship Code

INSA

- The International Naval Safety Association (INSA) was established in April 2008 in order to develop and maintain the Naval Ship Code.
- INSA participants are working together with the primary function of developing the Naval Ship Code.
- INSA consits of Navies and Classification Societies involved in naval business.
- Examples: UK, CAN, NLD, SWE, NOR, DEN, AUS etc. DNV, LR, BV etc.

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Why NSC?

- Governments with naval ships:

a. want them to be safe

b. may need to demonstrate their safety to stakeholders, including

  - i. the government themselves;
  - ii. the seafarers/operators;
  - iii. the nation's citizens;
  - iv. port authorities (at home and abroad);

c. want cost effective regulation;

d. want to build upon lessons learned internationally

Why not SOLAS?

- Technical Reasons

a. Some of the concepts used in the SOLAS regulations are not in common use in warships. An example is “bulkhead deck”;

b. Naval ships do things that commercial ships do not do. Examples are carriage of ammunition and troops and replenishment at sea

Why not SOLAS?

- Custom and Practice

c. Naval ships differ from merchant ships in many ways. Important safety examples include provision of lifeboats and provision of emergency generators. In both cases naval ships typically achieve the same goals in different ways.

d. Inclusion of such merchant ship mandatory rules to all naval ships would make the Code unacceptable and, to an extent, ridiculous.

Why not SOLAS?

- The relative priority given to the safety of the ship

e. Ref NSC Guide Part A Ch. 4

f. **In Naval Philosophy, the role of Naval ships is such that the safety of the Naval ship and embarked personnel may (perhaps in war) be secondary to the safety of those under the protection of the Naval ship.**

g. In Merchant Philosophy, ships provide a commercial service where safety of life at sea and protection of the environment are paramount.

How complete is the Code?

Naval Ship Code Edition 5 Maturity Matrix

	Tier 2: Functional Objectives	Tier 3: Performance Requirements	Tier 4: Solutions
Chapter I General Provisions	Mature	Mature	N/A
Chapter II Stucture	Mature	Mature	N/A
Chapter III Buoyancy, Stability & Controllability	Mature	Mature	Minor updates anticipated
Chapter IV Engineering Systems	Mature	Mature	N/A
Chapter V Not Used	-	-	-
Chapter VI Fire Safety	Mature	Mature	Major updates anticipated
Chapter VII Escape, Evacuation and Rescue	Mature	Mature	Mature
Chapter VIII Communications	Mature	Major updates anticipated	Major updates anticipated
Chapter IX Navigation	Mature	Major updates anticipated	Major updates anticipated
Chapter X Dangerous Goods	Mature	Minor updates anticipated	Minor updates anticipated

Fire Safety Chapter VI

- Based on SOLAS, HSC Code, DNV Naval (Pt 5.Ch.14 Sec. 11 Fire safety requirements for FRP naval vessels and special requirements for typical Naval
- Ship types based on SOLAS Special Purpopse Chip Code:
  - Type A +240 persons onboard,
  - Type B 240=>60 persons onboard and
  - Type C -60 persons onboard.
- Solutions text (prescriptive requirements) allows Type C ships to be built from other materials than steel.
- Non steel ship code based on HSC and DNV Naval (Pt 5.Ch.14 Sec. 11)

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New philosophy of containment of fire

Fire and smoke containment

- Major Changes
  - New Fire Resistance Notation to combine SOLAS and HSC methodologies
    - A30 (SOLAS) ≡ 60-30 (NSC) 30 (HSC) ≡ 30-30 (NSC)
    - Optional Notations e.g. S = smoke tight, R = load bearing, M = shock tested

      60-RM-30 (NSC)
  - Holistic Smoke & Fire Containment strategy
    - Reg 6–Smoke Control deleted and incorporated in to Reg 8–Fire & Smoke Containment
  - Fire Resistance to reflect the Fire Risk and Value of adjacent spaces
    - Aligns with HSC Code approach
    - Resolves issues of generic compartment groupings associated with SOLAS
    - Allows for the protection of operationally important (High Value) spaces
    - Guidance provided to allow assessment of unique compartments

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New philosophy of containment of fire

- Zoned Smoke Containment strategy
  - Clear smoke tight boundaries, improving situation awareness and escape
  - Reduces the complexity of HVAC design and eases ventilation recirculation

- Enhanced specification of smoke tight boundaries,
  - Smoke integrity maintained at all openings and penetrations, irrespective of size.
  - Removes commercial anomalies e.g. gaps under A-class doors, no requirement for dampers in HVAC ducts with a free cross-sectional area less than 0.075m^2.

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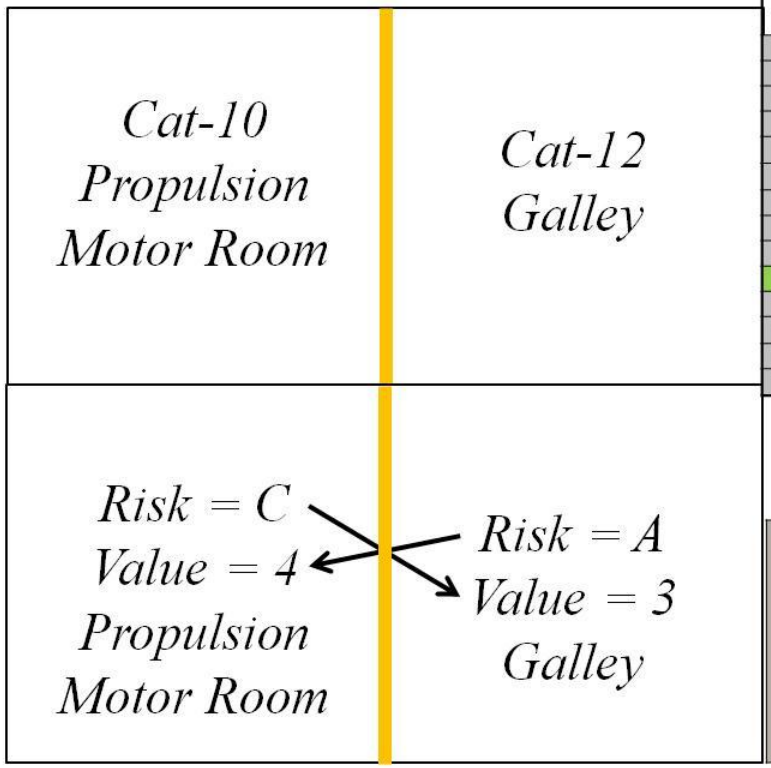
Fire and smoke containment



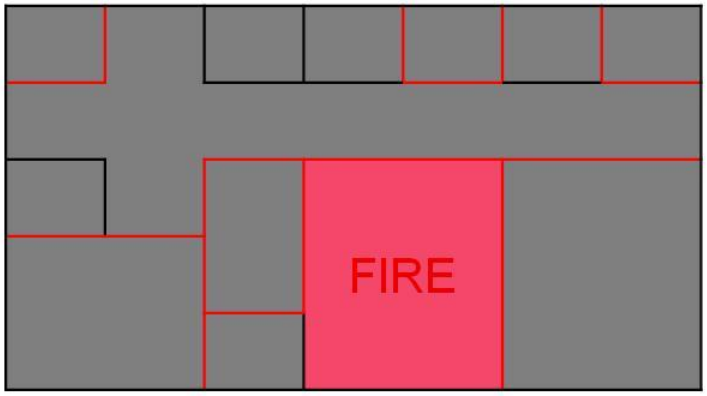
SOLAS - Bulkhead Matrix - Passenger Ship >36

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	B0	A0	A0	A0	A0	A60	A60	A60	A0	A0	A60	A60	A60	A60
2		A0	A0	A0	A0	A0	A15	A15	A0	A0	A15	A30	A15	A30
3			B15	A60	A0	B15	B15	B15	B15	A0	A15	A30	A0	A30
4					A0	A60	A60	A60	A0	A0	A60	A60	A60	A60
5						A0	A0	A0	A0	A0	A0	A0	A0	A0
6						B0	B0	B0	C	A0	A0	A30	A0	A30
7							B0	B0	C	A0	A15	A60	A15	A60
8								B0	C	A0	A30	A60	A15	A60
9									C	A0	A0	A0	A0	A0
10										A0	A0	A0	A0	A0
11											A0	A0	A0	A15
12												A0	A0	A60
13													A0	A0
14														A30

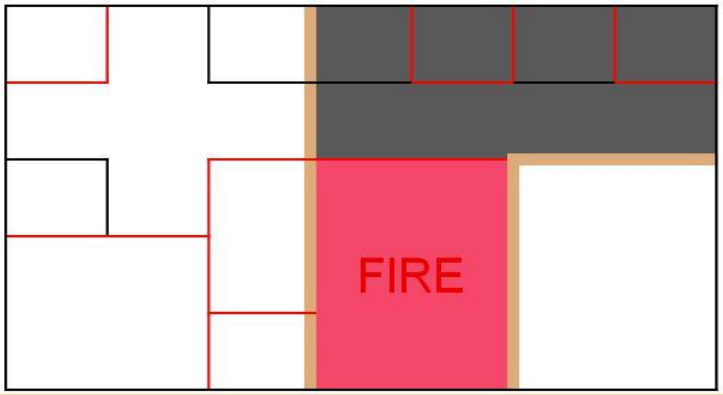
		Risk Classification				
		A	B	C	D	E
Value Classification	5	A60	A60	A30	A0	A0
	4	A60	A30	A15	A0	B15
	3	A30	A15	A0	B15	B0
	2	A0	A0	B15	B0	B0
	1	A0	B15	B0	B0	C

Fire and smoke containment

Commercial / Traditional Approach



Naval Ship Code



Naval Ships
- High compartmentalisation.
- Dissimilar adjacent compartments

Traditional (SOLAS) Approach
- Large number of A-class divisions
- Nominally smoke tight
- Complex HVAC design
- Large number of dampers

Naval Ship Code
- Equivalent number of fire resisting divisions
- Clear Smoke tight divisions
- Smoke Containment Zone
- High Risk Spaces

Consequences
- Simpler HVAC system, with less dampers
- Easier to adapt for CBRN re-circ
- Increased initial smoke spread
- Final smoke boundary reduced

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Thank you for your time!