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The littoral environment and product development

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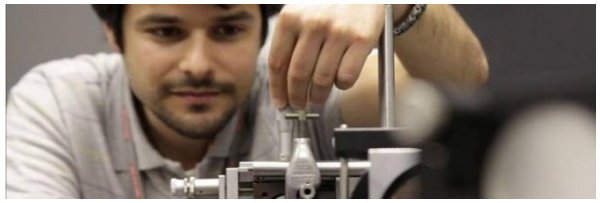

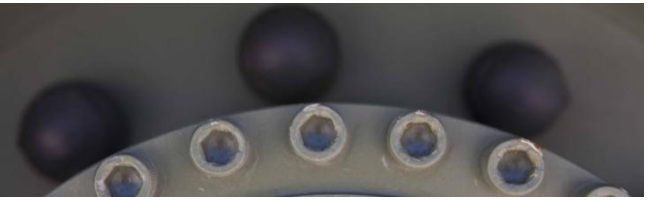
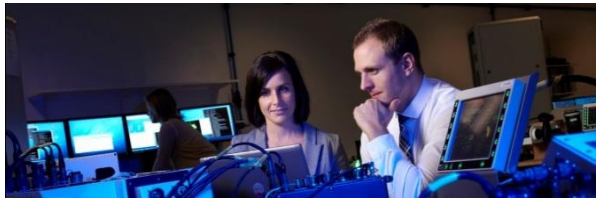


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Agenda

- The littoral environment and how it affects requirements
- Looking back: How Bofors have developed guns in the past
- Is there a future for guns?

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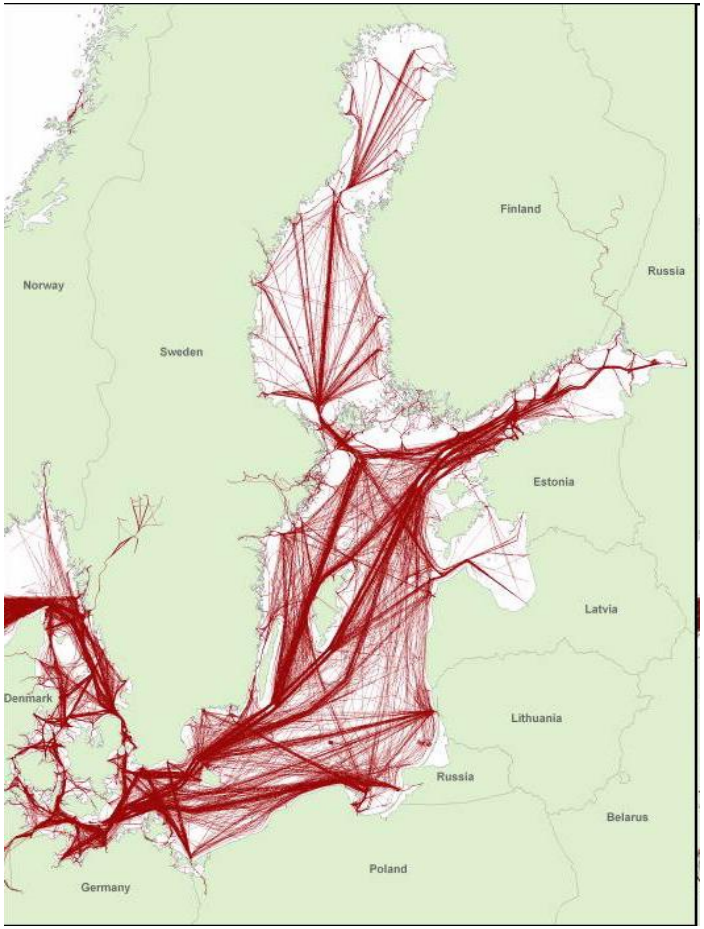
Littoral Warfare: the Baltic Sea



Complex and Complicated environment

- Confined
- Politically complex
- Economically important
- Shipping and fishing
- Valuable infrastructure
    - Cables
    - Pipe lines
- Demanding geography
- Islands and straits
- Variable depths,
- Currents
- Salinity

Aspects of the littorals: conclusions

- Favorable for the Defender
  - The defender can develop adapted materiel and concepts
- Limited Operational Depth
  - Short reaction times
  - Very short time from detection to engagement
  - Priority on defensive measures
- Multiple Threats
  - Optimised systems with multirole capability
  - Human factor is important
- A Systems Approach
  - Range is not everything: Accuracy, Reaction time, Effect!
  - Identification

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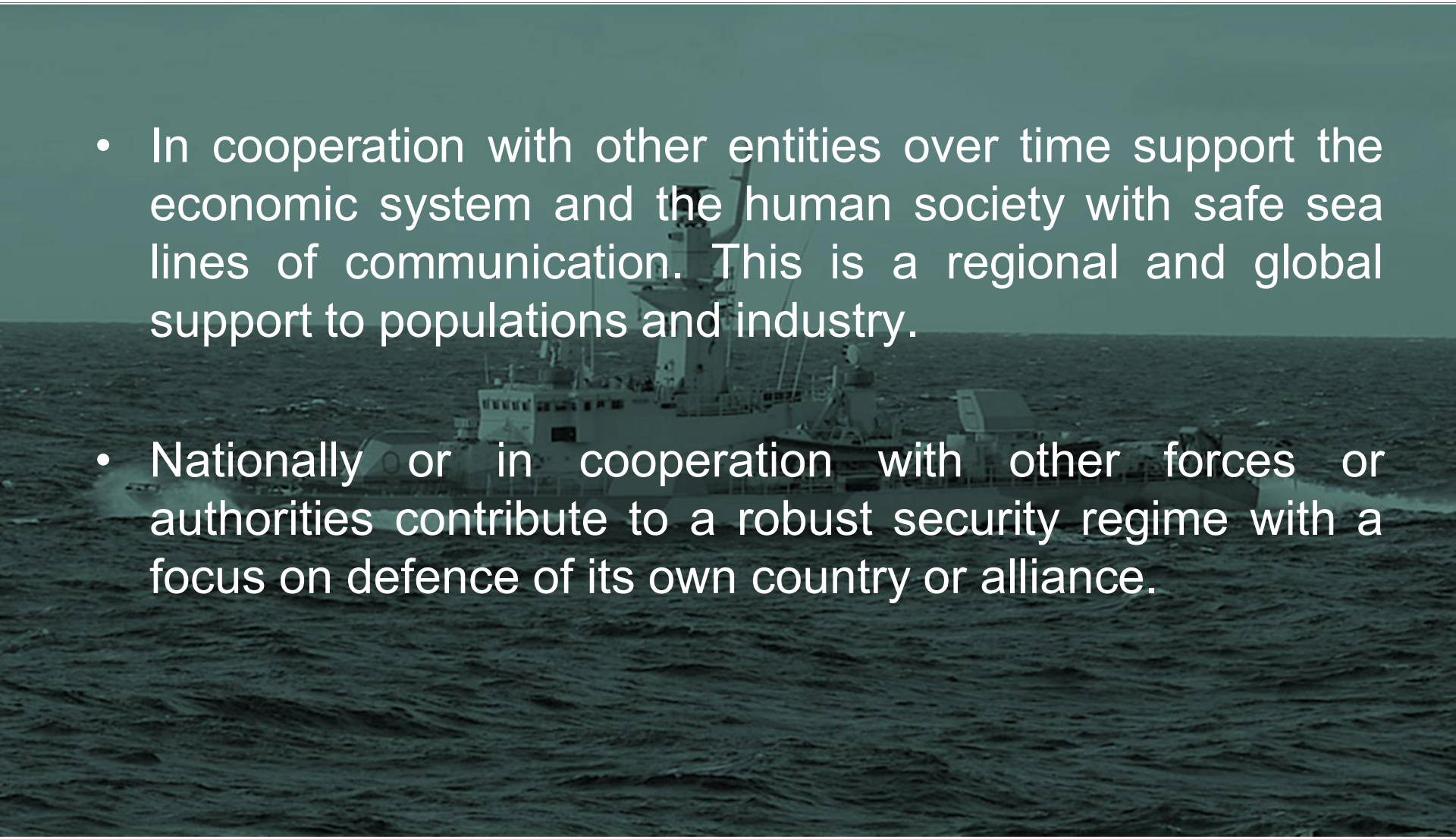
A Navy has two basic missions



- In cooperation with other entities over time support the economic system and the human society with safe sea lines of communication. This is a regional and global support to populations and industry.

- Nationally or in cooperation with other forces or authorities contribute to a robust security regime with a focus on defence of its own country or alliance.

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Criterias for success: What have we done?

Very close dialogue with end user
- Requirements are well known
- Lessons Learned through advanced training

Prioritiy to Air Defence: will give good capability in other roles

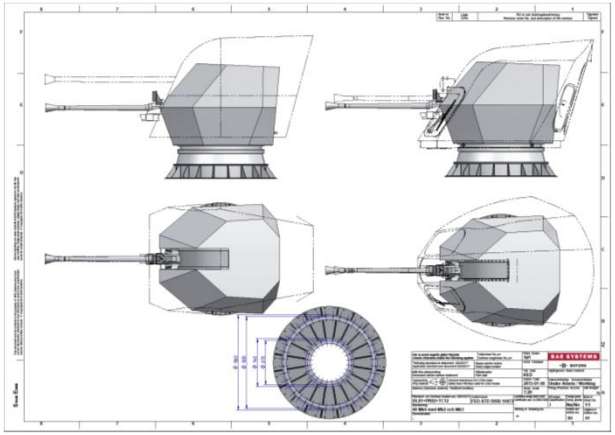
Systems approach
Concept of Kill Chain:
Close cooperation with FCS manufacturer
Specilised ammunition

Very rapid reloading

Short time to start and move gun: less than 3 seconds

Low LCC and user friendly

Useful system in all conflict levels, from peace to war.



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Evolutionary Design Philosophy

Big Navies can Afford Two Paths

- More of the same
  - DDG Arleigh Burke
  - CVN Nimitz / Gerald Ford
  - Etc.

- Giant-leap development
  - Littoral Combat Ship (LCS)
  - DD-X / Zumwalt
  - USS Nautilus
  - Seawolf SSN

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Evolutionary Design Philosophy

- Continuous development
  - Proven technologies
  - Extensive training
  - Maintain competence and know-how
- Novelty introductions
  - Step-by-step
  - Evolutionary thinking
  - Mid-life modernisations
- Risk mitigation
  - Parallel system development
  - Demonstrators
  - Cooperation

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The gun in the future? Yes!

The littoral environment:

Several tasks from peace to war will remain

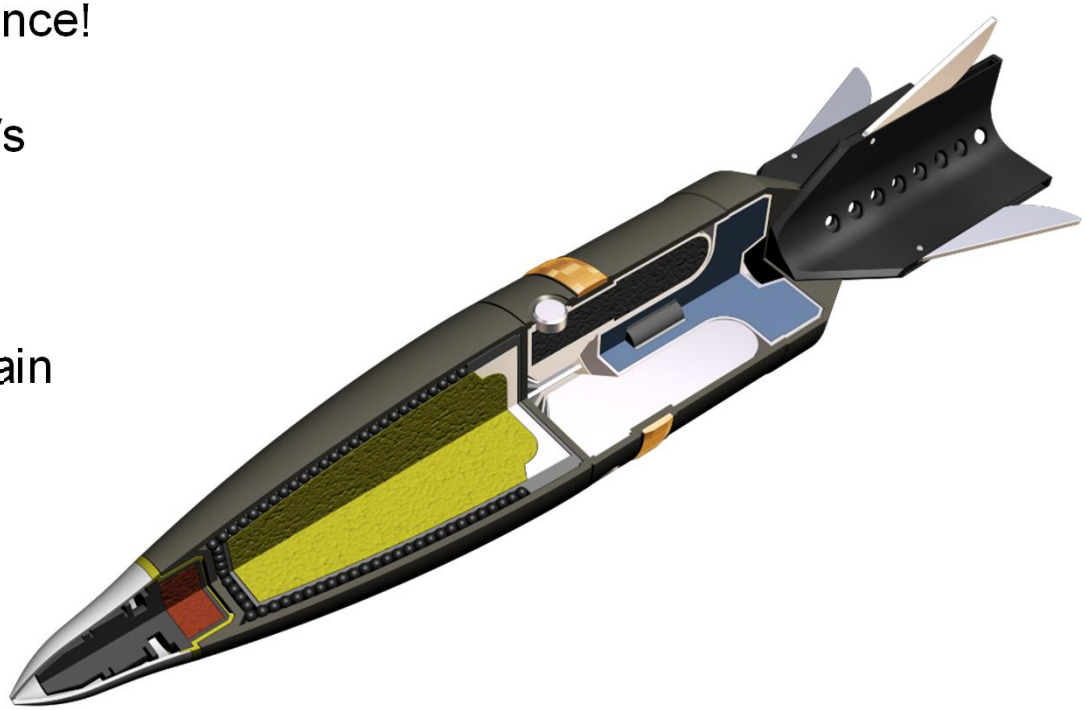
Priority to defensive role: Air Defence!

New threats/ targets: UAVs, USVs

Potential for development

A Systems approach: The Kill Chain

Cooperation



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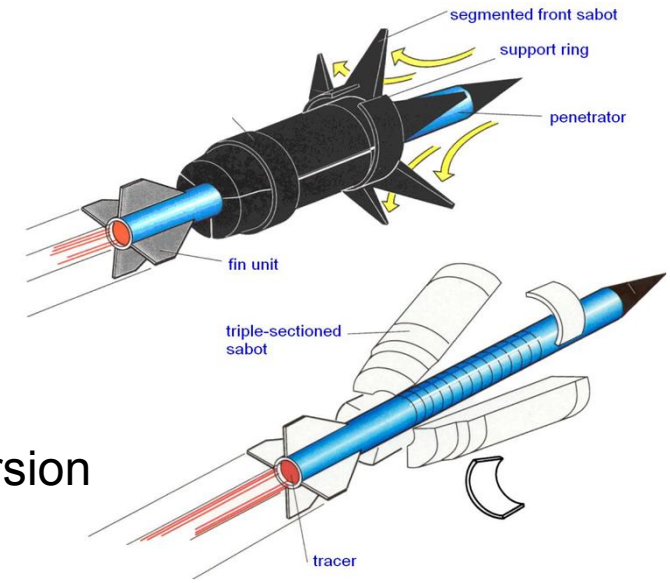
What can be done?

- Increase caliber! 40mm to 57 mm!
  - More explosives
  - More sensor technology
  - Longer range



- Higher velocity! (Pressure, Railguns etc)

- The Ammunition:
  - Better propellants! Higher velocity! Lower dispersion
  - Better ballistics: Higher velocity!
  - Better fuzes and better electronics
  - Better explosives: fire, pressure and pre-fragmentation

- Simulation and training: More effective doctrine.

- More affordable ammunition: More training and lessons learned.

- Lower LCC: A more affordable system over time.

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Thank you!

Questions?