OERLIKON CONTRAVES

Modular Design of Naval Gun Systems

Lessons Learned

Evolving Engineering and Design Criteria

An Iterative Process

- Desired characteristics
- Safety
- Operate in Naval environment
- Power to weight ratio (lethality)
- Mission capability

Fleet Requirements

- 2 axes stabilization
- 25 – 40 mm caliber
- No thru deck penetration
- Small footprint
- Minimum manning/maintenance
- Defense against “leakers” in the 1000 – 4000 m range band
- Maximize lethality
- Minimize target engagement times
- Current addition - Modular Design

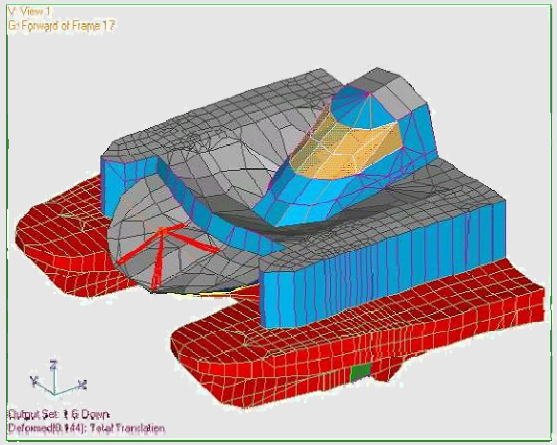
Components of the Experiment

- Design of the modular mount
- Firing stress and force analysis of the deck structure and blast over pressure
- Installation and integration of the EO/IR FCS
- Design and integration of an local control station console (LCC)
- Integration of the Gun/FCS/LCC with the on-board experimental CMS

35/1000 Revolver Cannon

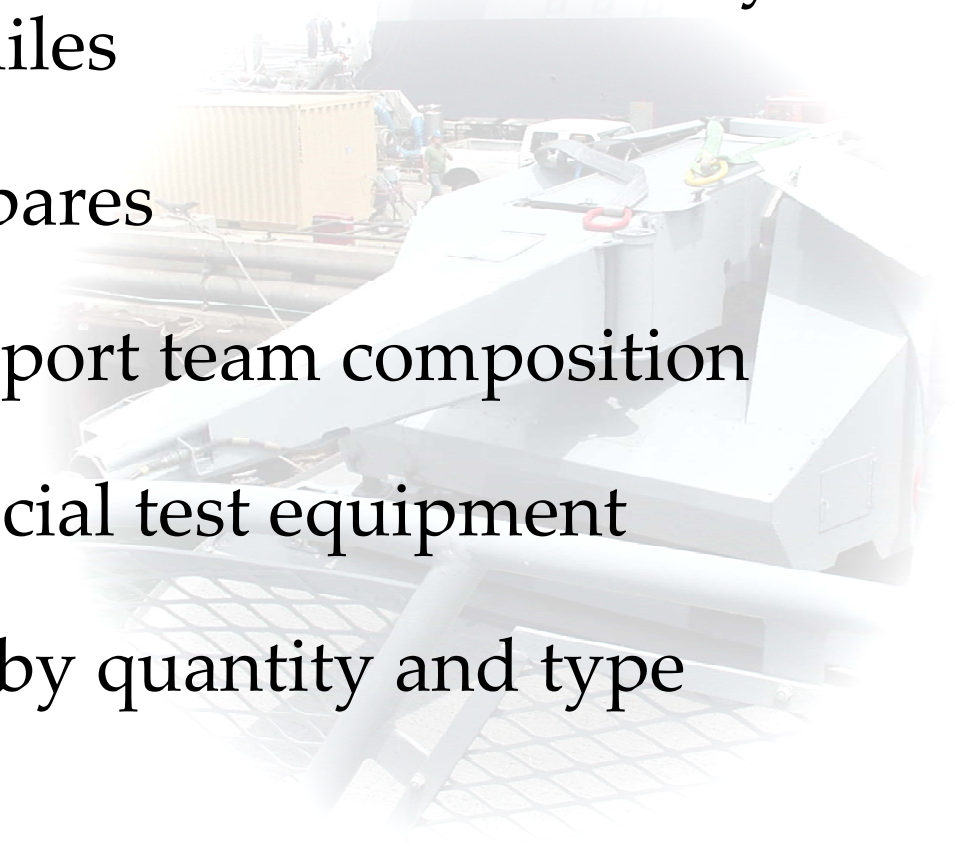
- Gun Features
- Auxiliary Systems
- Casualty Mode
- Fire Control
- Installation

Prototype



Logistics

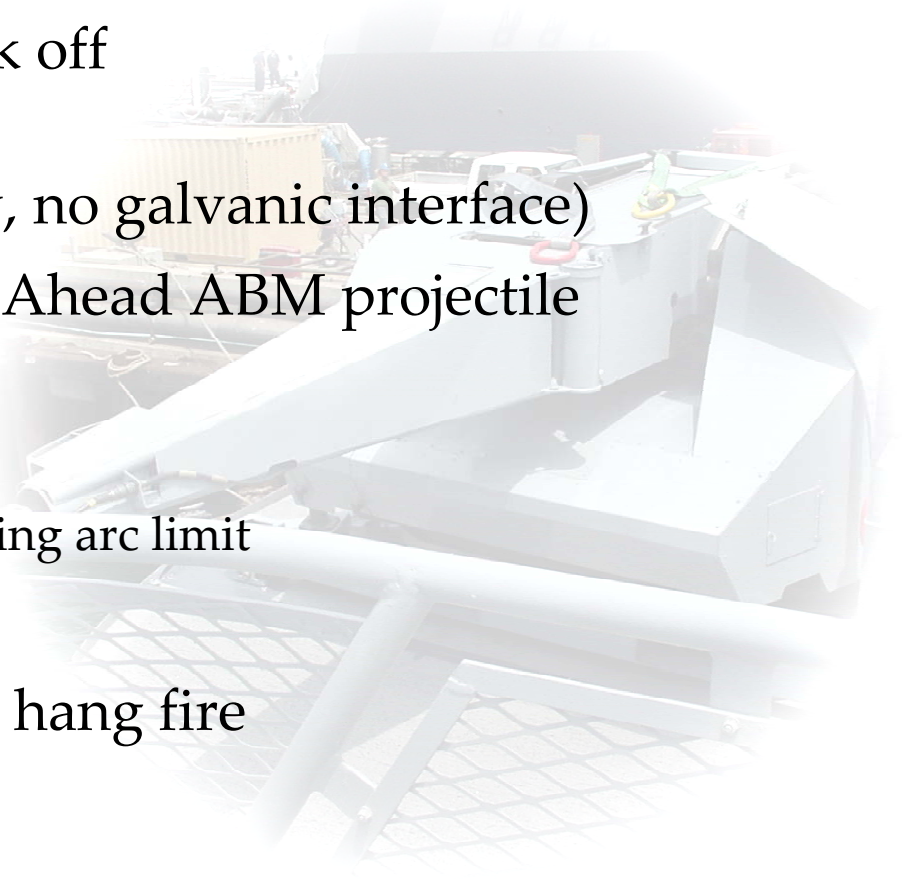
- Transporting the cannon and EO system nearly 6000 miles
- Selection of spares
- Technical support team composition
- Tools and special test equipment
- Ammunition by quantity and type



Safety

Gun and ammunition safety devices and features:

- Firing logic
- Eliminate hot gun/cook off
  - ✓ revolver drum cooling
- Safe fuzing (no battery, no galvanic interface)
- Barely no HE (0.9g) in Ahead ABM projectile
- Firing- Arcs
  - ✓ mechanical stops
  - ✓ computer controlled firing arc limit
- Firing pin lock
- Auto misfire ejection – hang fire



Manning and Maintenance

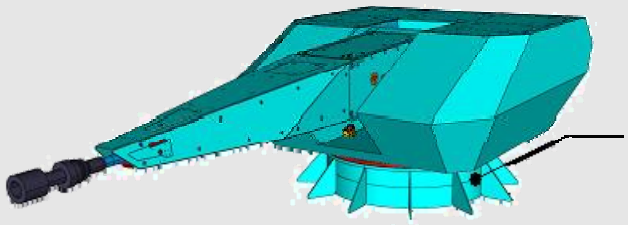
Reduce manning

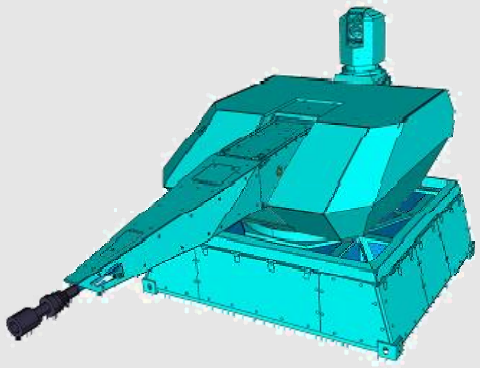
- No man on mount
  - ✓ Controlled and fired by one operator
- Maintenance and reload by two sailors
- Pre/post firing requires minimum skill

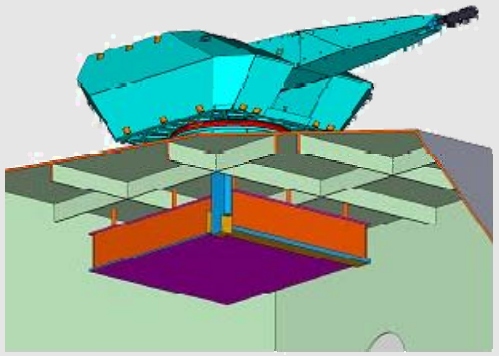
Reduced Maintenance

- Maximum BIT implementation
  - ✓ Off board health monitoring & diagnostics
- Minimize auxiliary systems
- Graceful swap-out/cross-deck
  - ✓ ISO = 30 minutes install/remove
- Rationalized tool sets

Modular Options







Conclusion

- Demonstrated the proof of concept
- Multiple advantages -virtually no disadvantages
- High payoff engineering and design enhancements
- Engineering and design synergy
  - ✓ risk of new features and improvements
  - ✓ mitigated by substantial increases in performance, maintainability and safety
  - ✓ modular menu is based on natural progression/collection of design technology

Questions

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