

Mobile Offshore Base

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ABSTRACT

A Mobile Offshore Base (MOB) provides a forward-deployable logistics facility capable of conducting flight, maintenance, supply and other military support operations. A general set of mission requirements, driven by fixed wing cargo aircraft operations, results in MOB concepts around 1,500 m (5,000 ft) in length. Both the specialized functions and long length of a MOB platform make it unique compared to any floating structure ever built. This paper describes the research and development efforts underway along with alternative structural concepts currently under consideration to meet the technical challenges.

Key Words: Megastructure, floating airfield, semisubmersible, platform, mobility, module connectors, logistics

INTRODUCTION

The Office of Naval Research (ONR) is conducting a Science and Technology (S&T) Program to assess technical feasibility for Mobile Offshore Bases (MOB) using commercial design procedures and standards. The MOB platform being sought is unique compared to any floating structure ever built. While the U.S. Department of Defense has not officially established mission requirements for a MOB, many of the proposed notional needs are unprecedented:

- Conventional take-off and landing of fixed-wing cargo aircraft at sea
- High-throughput cargo transfer to ships and landing craft in open oceans
- Large volume of climate-controlled storage for a variety of military cargo
- Selective accessibility to all cargo for retrieval, refurbishment, or repair
- Occupancy by a large group of military personnel even during storms
- Survivability in severe environments including hurricanes and typhoons
- Economical long-life maintainability and repairability
- Long-term station-keeping in deep water sites anywhere in the world

The primary objective of the ONR S&T Program is to resolve fundamental uncertainties regarding MOB feasibility and estimate cost. This is not an acquisition program. A collaborative team of industry participants, along with Government support, is working in four critical technology areas:

- Mission Requirements and Performance Measures
- Standards and Criteria
- Design Tools
- Alternative Concepts

This paper gives a brief summary of each technology area but primarily emphasizes system platform concepts. A better description of the overall program, including details of the program plan, is available at the World Wide Web address (<http://www.mob.mfesc.navy.mil>).

Mission Requirements and Performance Measures

This effort defines the functional requirements for potential MOB missions, and develops a rational procedure for evaluating alternative MOB concepts on the basis of functional performance, operational availability and system cost. These will allow rigorous evaluation of how well a specific MOB platform concept satisfies the mission requirements at a particular site. In addition, the effort will provide evaluation tools for conducting cost/benefit trade-off studies for unique sets of functional requirements. Providing a common design basis for design of alternative concepts, the list of functional requirements currently includes the following notional criteria:

- **Physical Size:** The overall dimensions would have to be at least 1,500 m (5,000 ft) long and 150 m (500 ft) wide in order to accommodate McDonnell Douglas C-17 Globemaster cargo aircraft on deck.
- **Structural Modularity:** Depending on temporal requirements, the MOB may operate as a single monohull (capable of transferring cargo by helicopter or ocean vessel) or as a connected set of modules (capable of landing fixed wing aircraft).
- **Logistics Capability:** The MOB should contain up to 800,000 m³ (9 million ft³) of environmentally controlled dry cargo