Discrete-Event Simulation of the Establishment of a Bare Beachhead for Long-Term Joint Logistics over the Shore (JLOTS) Operations

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Abstract: The United States military uses Joint Logistics Over-the-Shore (JLOTS) operations to move soldiers, vehicles, and equipment across the globe for military and humanitarian missions. These logistics operations can only be accomplished through cooperation between commanders in all services. The U.S. Army Engineer Research and Development Center is developing a tool to analyze a set of early entry alternatives to optimize mission effectiveness and efficiencies in order to facilitate assured mobility and freedom of movement. This program is currently being developed under the name Planning Logistics Analysis Network System (PLANS). PLANS comprehensively covers air, land, and sea transportation infrastructure, regions of avoidance, and more. This research addresses a gap in strategic and operational planning by modeling the establishment of JLOTS operations on bare beach environments. The West Point-developed discrete event simulation will determine the amount of time it takes to prepare a beach to sustain JLOTS operations under varying environmental and operational conditions.

Keywords: JLOTS, bare beachhead, discrete-event simulation

1. Introduction

JLOTS is defined as the transportation of people and their resources from ship to shore for both military and humanitarian missions. JLOTS operations are critical links to the projection, deployment, and sustainment of United States military forces across the globe. The Army, Air Force, Coast Guard, and Navy all play an integral part in the successful execution of any JLOTS operation. These operations move everything required of the deployed force -- personnel, fuel, food, and vehicles. The military has the capability to use existing ports, improve degraded ports, or utilize bare beaches (Joint Pub 4-01.6, 1998). Operation OVERLORD, more commonly known as D-Day, is a historic and iconic example of a full-scale JLOTS operation. In this instance, all necessities of the operation and follow-on missions were landed on a bare beach. A bare beach landing site typically has no mechanical infrastructure beneficial to throughput operations. Due to its complex nature, the time, resources, and funding to conduct a full-scale JLOTS training exercise is rarely available. Simulating this type of operation can develop the capabilities and coordination between the branches without committing considerable resources.

The training exercises, doctrine, and history of logistical operations tends to focus on the operational aspect rather than the preparation (Thede, et al., 1995). This research will show that modeling JLOTS preparation in a bare beach scenario by incorporating doctrine, historical data, and information gleaned from interviews with current commanders will help develop an often overlooked component of a JLOTS operation, and simulating the preparation will help develop the capabilities and coordination between the branches without committing considerable resources.

2. Background

2.1 Project Scope

The United States Military Academy at West Point Department of Systems Engineering formed this capstone group project in conjunction with the U.S. Army’s Engineer Research and Development Center’s Information Technology Lab (ERDC ITL) to develop a model for JLOTS preparation. The simulation begins with all the ships successfully staged offshore. It continues through the process of setting up necessary infrastructure to allow throughput of materials. The simulation concludes when all the allotted equipment is positioned to accept throughput. The model analyzes the beach composition,