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| REPORT DOCUMENTATION PAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                              |                            | Form Approved<br>OMB No. 0704-0188       |                                                               |
| Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                             |                              |                            |                                          |                                                               |
| 1. REPORT DATE (DD-MM-YYYY)<br>13-02-2006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             | 2. REPORT TYPE<br>FINAL      |                            | 3. DATES COVERED (From - To)             |                                                               |
| 4. TITLE AND SUBTITLE<br>Current Limitations to Joint Logistics Over-the-Shore (JLOTS)<br><br>and the Road Ahead                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |                              |                            | 5a. CONTRACT NUMBER                      |                                                               |
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| 6. AUTHOR(S)<br><br>LCDR Mark C. Rice, SC, USN<br><br>Paper Advisor (if Any): COL(Se1.) Bryan T. Newkirk, USA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                              |                            | 5d. PROJECT NUMBER                       |                                                               |
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| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)<br><br>Joint Military Operations Dept.<br>Naval War College<br>686 Cushing Road<br>Newport, RI 02841-1207                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                             |                              |                            | 8. PERFORMING ORGANIZATION REPORT NUMBER |                                                               |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                             |                              |                            | 10. SPONSOR/MONITOR'S ACRONYM(S)         |                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |                              |                            | 11. SPONSOR/MONITOR'S REPORT NUMBER(S)   |                                                               |
| 12. DISTRIBUTION / AVAILABILITY STATEMENT<br>Distribution Statement A: Approved for public release; distribution is unlimited.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                             |                              |                            |                                          |                                                               |
| 13. SUPPLEMENTARY NOTES A paper submitted to the faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                             |                              |                            |                                          |                                                               |
| 14. ABSTRACT<br>Joint Logistics Over-the-Shore (JLOTS), the process of loading and unloading ships without the benefit of deep draft-capable, fixed port facilities by Navy and Army forces under the command of a Joint Force Commander, is an essential capability for Combatant Commanders (CCDRs) operating in the current worldwide threat environment. As forces are called upon to project power to strike terrorists and nations that harbor terrorists before they threaten the American homeland, CCDRs must be able to support and sustain those forces. The thesis of this paper is that JLOTS, if properly leveraged, can be used to effectively support and sustain forces deployed in austere environments. To properly leverage JLOTS, planners must focus on the management of two critical issues - throughput and safety. Both throughput and safety are affected and often limited by physical conditions in the JLOTS operation area, force protection considerations, the level of training of JLOTS personnel, and equipment compatibility. This paper investigates ongoing acquisition programs and training concepts aimed at improving JLOTS capability, and then recommends three steps to maximize the contribution of JLOTS to mission accomplishment: centralizing JLOTS funding with the CCDRs; incorporating JLOTS feasibility assessments into all operational planning; and establishing a standing JLOTS staff on each geographic CCDR's staff. |                             |                              |                            |                                          |                                                               |
| 15. SUBJECT TERMS<br>Joint Logistics Over-the-Shore (JLOTS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                             |                              |                            |                                          |                                                               |
| 16. SECURITY CLASSIFICATION OF:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |                              | 17. LIMITATION OF ABSTRACT | 18. NUMBER OF PAGES<br><br>26            | 19a. NAME OF RESPONSIBLE PERSON<br>Chairman, JMO Dept.        |
| a. REPORT<br>UNCLASSIFIED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | b. ABSTRACT<br>UNCLASSIFIED | c. THIS PAGE<br>UNCLASSIFIED |                            |                                          | 19b. TELEPHONE NUMBER (include area code)<br><br>401-841-3556 |

**NAVAL WAR COLLEGE  
Newport, RI**

**Current Limitations to Joint Logistics  
Over-the-Shore (JLOTS) and the Road Ahead**

**By**

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**A paper submitted to the faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.**

**The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.**

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**13 February 2006**

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## **Abstract**

Joint Logistics Over-the-Shore (JLOTS), the process of loading and unloading ships without the benefit of deep draft-capable, fixed port facilities by Navy and Army forces under the command of a Joint Force Commander, is an essential capability for Combatant Commanders (CCDRs) operating in the current worldwide threat environment. As forces are called upon to project power to strike terrorists and nations that harbor terrorists before they threaten the American homeland, CCDRs must be able to support and sustain those forces. The thesis of this paper is that JLOTS, if properly leveraged, can be used to effectively support and sustain forces deployed in austere environments. To properly leverage JLOTS, planners must focus on the management of two critical issues – throughput and safety. Both throughput and safety are affected and often limited by physical conditions in the JLOTS operation area, force protection considerations, the level of training of JLOTS personnel, and equipment compatibility. This paper investigates ongoing acquisition programs and training concepts aimed at improving JLOTS capability, and then recommends three steps to maximize the contribution of JLOTS to mission accomplishment: centralizing JLOTS funding with the CCDRs, incorporating JLOTS feasibility assessments into all operational planning, and establishing a standing JLOTS staff on each geographic CCDR's staff.

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## Introduction

Joint Logistics Over-the-Shore (JLOTS), the “process of loading and unloading ships without the benefit of deep draft-capable, fixed port facilities” by Navy and Army forces under the command of a Joint Force Commander (JFC),<sup>1</sup> is an essential capability for Combatant Commanders (CCDRs) operating in the context of the Global War on Terror (GWOT) and the current worldwide threat environment. As forces are called upon to project power to strike terrorists and nations that harbor terrorists before they threaten the American homeland, CCDRs must be able to support and sustain those forces. The thesis of this paper is that JLOTS, if properly leveraged, can be used to effectively support and sustain forces deployed in austere environments. To properly leverage JLOTS, CCDRs, JFCs, Joint Task Force Commanders (JTFCs), and JLOTS commanders must focus on the management of two critical issues – throughput and safety. Both throughput and safety are affected and often limited by physical conditions encountered in the Logistics Over-the-Shore Operation Area (LOA) such as soil type, beach gradient, water depth, tides, tidal range, currents, weather, and sea state; force protection considerations; the level of training of JLOTS personnel; and equipment compatibility. This paper investigates ongoing acquisition programs and evolving training concepts aimed at mitigating some of the risk associated with these limitations, and then recommends three steps CCDRs can take to maximize the contribution of JLOTS to mission accomplishment. These three steps include centralizing JLOTS funding with the CCDRs; incorporating JLOTS feasibility assessments into all operational planning to better make the case for centralizing funding with the CCDRs; and establishing a standing JLOTS staff on each geographic CCDR’s staff to complete the feasibility assessments without detracting from ongoing logistics planning. Taken together, these steps could expand CCDRs’

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<sup>1</sup> U.S. Joint Chiefs of Staff, Joint Tactics, Techniques and Procedures for Logistics Over the Shore, Joint Publication 4-01.6 (Washington D.C.: 5 August 2005), xi.

ability to leverage JLOTS, especially in terms of throughput and safety, to meet operational requirements in the area of responsibility (AOR).

## **Relevance of JLOTS**

Faced with the GWOT and current worldwide threats to the peace and security of the United States, the National Security Strategy, National Defense Strategy, and National Military Strategy have focused on defense in depth – preemptively taking the fight to terrorists and nations that harbor terrorists before they reach American territory, while at the same time strengthening homeland defenses. The National Security Strategy clearly spells out the preemptive nature of the strategy: “we will disrupt and destroy terrorist organizations by...defending the United States, the American people, and our interests at home and abroad by identifying and destroying the threat before it reaches our borders.”<sup>2</sup> To successfully take the fight to the enemy, the National Security Strategy notes the need to develop a wide variety of military capabilities that enable theater access for US forces.<sup>3</sup> The National Defense Strategy goes further: “Our role in the world depends on effectively projecting and sustaining our forces in distant environments where adversaries may seek to deny us access.”<sup>4</sup> The National Military Strategy goes beyond enemy access denial, noting, “the United States will conduct operations in widely diverse locations – from densely populated urban areas located in littoral regions to remote, inhospitable and austere locations.”<sup>5</sup> From these three documents, it is clear that projecting power by inserting forces in diverse locations is only part of the equation. Supporting and sustaining those forces is just as important. Historically, more than 90 percent of wartime cargo and fuel transported to support and sustain American forces has been

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<sup>2</sup> The White House, The National Security Strategy of the United States of America (Washington D.C.: September 2005), 6.

<sup>3</sup> Ibid., 30.

<sup>4</sup> U.S. Department of Defense, The National Defense Strategy of the United States of America (Arlington: March 2005), 13.

<sup>5</sup> U.S. Joint Chiefs of Staff, National Military Strategy of the United States of America: A Strategy for Today; A Vision for Tomorrow (Arlington: 2004), 5.

transported on ships; but when large sealift ships cannot be docked in port, JLOTS capability could be used to accomplish the mission.<sup>6</sup> Whether existing ports are degraded by hostile enemy action, are unimproved and insufficient to support deep draft shipping, or simply do not exist, JLOTS enables the throughput of sustainment supplies and equipment required for CCDRs' operations into austere environments. Consequently, JLOTS could serve as a critical enabler for CCDRs to conduct operations in support of national strategy.

### **JLOTS Definition**

To fully understand the potential that JLOTS brings to CCDRs' operations, it is important to clearly understand the scope of JLOTS. As noted in the Introduction, JLOTS is the "process of loading and unloading ships without the benefit of deep draft-capable, fixed port facilities" by Navy and Army forces under the command of a JFC.<sup>7</sup> JLOTS operations can be conducted over unimproved beaches, through fixed ports that are inaccessible to deep draft shipping, or through fixed ports that are unimproved and lack the necessary facilities to effectively offload deep draft shipping.<sup>8</sup> JLOTS operations may be either dry – offloading cargo and equipment via lighterage,<sup>9</sup> or wet – delivering liquid petroleum products or fresh water via an offshore petroleum discharge system (OPDS) to an inland petroleum distribution system (IPDS).<sup>10</sup> The scope of JLOTS operations is broad in that it includes all the processes beginning with the acceptance of ships for

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<sup>6</sup> "Foal Eagle '98," Army Logistician (Fort Lee: July/August 1999): 2.

<sup>7</sup> U.S. Joint Chiefs of Staff, Joint Publication 4-01.6, xi.

<sup>8</sup> U.S. Chief of Naval Operations (N81), Joint Logistics Over-the-Shore (JLOTS) Support Systems Mission Need Statement (MNS) (Arlington: 3 September 1997), 3.

<sup>9</sup> U.S. Joint Chiefs of Staff, Joint Publication 4-01.6, GL-12. Lighterage is the process in which small craft are used to transport cargo or personnel from ship to shore. Lighterage may be performed using amphibians, landing craft, discharge lighters, causeways, and barges. In most cases, JLOTS doctrine and literature refer to all small craft used in lighterage as "lighters." For consistency, this paper will use the term "lighters" when referring to small craft in general.

<sup>10</sup> Joint Deployment Training Center, "Joint Logistics Over-the-Shore," Joint Deployment Process Course CD-ROM (Fort Eustis: August 2002).

offload and ending with the arrival of cargo and equipment at the inland staging and marshalling area.<sup>11</sup>

### **JLOTS Responsibilities**

Joint doctrine denotes that each geographic CCDR has overall responsibility for JLOTS operations that take place in his AOR. The effectiveness of these JLOTS operations will be measured by the level of throughput and safety achieved. As a result, the CCDR must be acutely aware of the capabilities and responsibilities of the players who will directly impact throughput and safety.

The supported CCDR identifies potential requirements for JLOTS operations during the planning process and ensures appropriate force apportionment, develops the JLOTS concept of operations, exercises combatant command over assigned forces, ensures security and force protection, allocates resources, and designates the JLOTS commander.<sup>12</sup> The JLOTS commander may come from either the Army or the Navy, is subordinate to the JFC or JTFC, and is responsible for the detailed planning and execution of JLOTS operations. The JLOTS commander publishes an operation order or directive delineating responsibilities and procedures; works with superiors in selecting the LOA; executes JLOTS operations, from the acceptance of ships for offload to the arrival of equipment and cargo at inland staging and marshalling areas; and coordinates OPDS operations.<sup>13</sup>

Participating Service and United States Transportation Command (USTRANSCOM) components are responsible for providing representatives to a central planning team that supports

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<sup>11</sup> U.S. Joint Chiefs of Staff, Joint Publication 4-01.6, II-6.

<sup>12</sup> Ibid., II-1 – II-2.

<sup>13</sup> Ibid., II-6.

the JLOTS commander in the planning and execution of JLOTS operations.<sup>14</sup> Additionally, each component must provide personnel and equipment to accomplish the JLOTS mission.

Since both the Army and Navy possess the capability to conduct Logistics Over-the-Shore (LOTS) independently, they share many of the same competencies, such as lighterage operations. Nonetheless, in joint operations Army responsibilities typically focus on operations ashore, which include transport to inland staging areas; preparation of unimproved beach surfaces; preparation of marshalling areas for the storage of containers, breakbulk cargo, and rolling stock; and installation and operation of IPDS (from the high water mark).<sup>15</sup> In joint operations, Navy responsibilities typically focus on operations at sea, which include tactical control over the disposition and operation of participating ships as necessary to provide force protection; installation and operation of OPDS (to the high water mark); installation of cargo discharge facilities such as elevated causeway systems or floating causeways; lighterage operations; and production of hydrographic surveys and engineering reconnaissance for LOA selection.<sup>16</sup>

In addition to Army and Navy responsibilities, the Marine Corps can be designated by the CCDR as responsible for force protection of the LOA. The Coast Guard can also be designated by the CCDR to take on force protection responsibilities with their Port Security Units, and to provide cargo handling specialists for munitions and explosives.<sup>17</sup> USTRANSCOM's critical role as the manager of the Defense Transportation System (DTS), including oversight of Military Sealift Command (providing most of the lift capacity for JLOTS operations) and responsibilities as the Single Port Manager for worldwide common user seaports (including sites requiring JLOTS),

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<sup>14</sup> Ibid.

<sup>15</sup> Ibid., II-3.

<sup>16</sup> Ibid., II-4.

<sup>17</sup> Ibid., II-5.

cannot be overstated.<sup>18</sup> With responsibilities spread throughout the Service and USTRANSCOM components, JLOTS operations are truly joint, complex operations that require significant coordination in both planning and execution to achieve the necessary levels of throughput and safety.

### **Typical JLOTS Operation**

To better understand the complexity in planning and executing JLOTS, it is useful to consider the typical JLOTS operation. As with all joint operations, JLOTS operations begin with planning. Ideally, JLOTS planning is accomplished concurrently with operational planning to clearly determine logistics requirements, establish priorities, and determine resource allocation.<sup>19</sup> An LOA must be selected to best support the JFC's concept of operations. Some of the factors involved in selecting the LOA include soil type, beach gradient, water depth, tides, tidal range, currents, weather, sea state, inland infrastructure, and force protection requirements. The selected LOA, whether an unimproved port, degraded port, or bare beach, will be a key component in determining safety risks to personnel and equipment, as well as the throughput that can be achieved. Throughput is the "average movement of containers, wheeled vehicles, tracked vehicles, breakbulk cargo, and bulk liquid cargo that can pass through a port or beach daily." Throughput is a key driver in determining the size of the force that can be supported and the length of time that force can be supported. Throughput is impacted by five events in execution of the typical JLOTS operation: ship cargo transfer, cargo movement from ship-to-shore (lighter transit time), beach cargo transfer, cargo movement (transit time) to marshalling yards, and cargo clearance from the port complex.<sup>20</sup>

Ship cargo transfer, also referred to as ship discharge operations, includes roll-on/roll-off (RO/RO) discharge, container discharge, and breakbulk discharge. RO/RO discharge is

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<sup>18</sup> Ibid., II-2.

<sup>19</sup> Ibid., III-1.

<sup>20</sup> Ibid., III-2.

accomplished by either RO/RO ships or auxiliary crane ships (T-ACS). In favorable weather conditions, vehicles are driven off RO/RO ships onto roll-on/roll-off discharge facilities (RRDFs) that are moored<sup>21</sup> alongside the ships. The RRDF consists of six non-powered causeway sections assembled into a platform that acts as a floating pier. From the RRDF, vehicles are driven onto lighters for transit ashore. If weather precludes use of the RRDF, vehicles are lifted by cranes onboard the T-ACS directly onto lighters.<sup>22</sup> Container discharge, though, is the primary function of the T-ACS. The T-ACS offloads containers from the container ship directly onto lighters.<sup>23</sup> Breakbulk discharge can be the most challenging ship discharge operation, as it includes transfer of non-homogeneous cargo such as pallets, bags, bales, cartons, crates, cases, barrels, or drums. It is normally discharged directly over the side of the cargo ship into lighters using the ship's gear. To further complicate breakbulk discharge, most Class V material (ammunition of all types, chemical and special weapons, bombs, explosives, mines, fuses, detonators, pyrotechnics, missiles, rockets, propellants, and other associated items) with its inherent special handling requirements is shipped as breakbulk.<sup>24</sup>

After ship discharge operations, lighters move cargo ashore. The typical JLOTS operation may include the following lighters: Landing Craft, Mechanized (LCM), Landing Craft, Utility (LCU) 1600 or 2000 Class, Landing Craft, Air Cushion (LCAC), Causeway Section, Powered (CSP), Side Loadable Warping Tug (SLWT), Causeway Section, Non-powered (CSNP), Causeway Ferry (CF), Lighter, Amphibious Re-supply Cargo (LARC-V), Logistics Support Vessel (LSV), and barges. The type of lighter, type of cargo, and LOA conditions will determine if beach cargo

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<sup>21</sup> Ibid., GL-14. Moored is defined as lying with both anchors down or tied to a pier, anchor buoy, or mooring buoy. An RRDF forms a platform, much like a floating pier, that is used as a transfer point for cargo discharged from the ship and loaded onto lighters.

<sup>22</sup> Ibid., VI-9. An auxiliary crane ship (T-ACS) provides lift capability to move cargo from cargo ships to lighters. Most often used in ports with limited or no crane service, the T-ACS is anchored in a position that facilitates the ability of both cargo ships and lighters to come alongside for cargo transfer.

<sup>23</sup> Ibid., VI-7.

<sup>24</sup> Ibid., VI-10.

transfer will be accomplished directly on the beach or via a platform connected to the beach such as a causeway pier (CWP) or an elevated causeway system (ELCAS).<sup>25</sup> Though specific circumstances will dictate beach cargo transfer methods, typically RO/RO cargo will be discharged directly to the beach. If lighters cannot approach close enough to the beach to discharge RO/RO cargo, then it will be offloaded to a floating CWP.<sup>26</sup> If an ELCAS is in place, containers are offloaded from lighters by ELCAS cranes directly onto trucks driven ashore. Breakbulk cargo can be offloaded in a similar fashion via ELCAS, but because of crane cycle time, it is more efficiently offloaded directly to the beach.

Once cargo is on the beach, Beach Clearance Units (BCUs) organize the beach area to support throughput. The BCU, which is task-organized around an Army cargo transfer company from a terminal service battalion, a Navy beachmaster unit, or a Marine Corps landing support company, is responsible for unloading lighters and transferring cargo to the marshalling area. At the marshalling area, cargo is turned over to the Service components and prepared for onward movement in accordance with established Service procedures.<sup>27</sup>

The Offshore Petroleum Discharge System (OPDS) and Inland Petroleum Distribution System (IPDS) may also be included in the typical JLOTS operation. OPDS provides a semi-permanent, all-weather facility for the bulk transfer of petroleum, oils, and lubricants directly from an offshore tanker to a beach termination unit located immediately inland from the high water mark.<sup>28</sup> From the beach termination unit, IPDS is used for inland distribution of petroleum, oils, and lubricants. If OPDS and IPDS are included in the JLOTS operation, the JLOTS commander is responsible for reception of the OPDS vessels, as well as installation and operation of OPDS to the

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<sup>25</sup> Ibid., VII-1.

<sup>26</sup> Ibid., VIII-2.

<sup>27</sup> Ibid., VIII-3 – VIII-6.

<sup>28</sup> Ibid, GL-16.

beach termination unit. Units operating IPDS are responsible for inland distribution. These units may or may not be under the tactical control of the JLOTS commander; regardless, close coordination is required between OPDS and IPDS to ensure necessary throughput can be achieved.<sup>29</sup>

### **JLOTS Limitations**

Despite the noted relevance of JLOTS in terms of GWOT and the current worldwide threat environment faced by the United States, as well as the robust capability of typical JLOTS operations outlined in doctrine, several factors severely limit JLOTS execution by adversely affecting both throughput and safety. Physical conditions in the LOA, force protection considerations, the level of training of JLOTS personnel, and the compatibility of JLOTS equipment all play a part in limiting the throughput and safety of JLOTS operations. The combined effect of each of these factors can severely limit, if not completely negate, the current JLOTS capability. Referring to both throughput and safety problems, retired Vice Admiral James B. Perkins III remarked, “While I was the Commander of the Military Sealift Command, I lived in fear that someone would tell me we needed to offload an MSC ship in-stream.”<sup>30</sup> Clearly, JLOTS execution has a great deal of associated safety and throughput risks. Operational leaders planning a JLOTS operation must understand the source and nature of these risks to effectively manage them.

The first, and perhaps most critical limiting factor to the successful execution of JLOTS operations, is the physical condition of the LOA. The physical condition of the LOA includes such factors as soil type, beach gradient, water depth, tides, tidal range, currents, weather, and sea state. The beach soil type impacts beach cargo transfer. If the beach soil type is too soft, heavy cargo and cargo handling equipment may be unable to transit the beach without sinking into the ground. The

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<sup>29</sup> Ibid., XI-1.

<sup>30</sup> Vice Admiral James B. Perkins III (USN, retired), Emory S. Land Chair of Merchant Marine Affairs at the Naval War College, interview by author, Newport, RI, 11 January 2006.

result can be bottlenecks to throughput and damage to cargo and cargo handling equipment. BCUs can install special matting materials to mitigate these risks to throughput and cargo safety, but installation adds an additional, potentially time consuming step to the preparation for JLOTS operations that can limit initial throughput. Beach gradient, coupled with water depth, is a limiting factor to both lighterage operations and beach cargo transfer. Beaches with mild or flat gradients (and, as a result, shallow water) cause lighters to run aground before they reach the beach. As a result, discharge equipment must be moved into the sea, increasing discharge time and safety hazards to both cargo and personnel. Conversely, beaches with gradients that are too steep often have currents that make handling lighters exceedingly difficult, increasing the safety risk to lighters, cargo, and personnel.<sup>31</sup> Additionally, beaches with steep gradients cause problems for container-handling. Specifically, beach tractors are only two-wheel drive. With no off-road capability, a steep beach gradient can render beach tractors useless, severely limiting throughput.<sup>32</sup> While soil type and beach gradient can limit dry cargo transfer, the sea bottom can have a significant effect on wet cargo transfer accomplished via OPDS. OPDS can operate in relatively severe sea state and weather conditions (operate up to sea state 5, survive up to sea state 7); however, it cannot withstand the wear and tear inflicted by rock or hard coral bottoms. As a result, it cannot be installed on these sea bottoms.<sup>33</sup> Tides and tidal ranges are also important planning factors for JLOTS operations. High and low water marks drive the positioning of OPDS equipment by impacting where the beach termination unit can be placed to safely connect OPDS (designed solely for seaside liquid cargo transfer) to IPDS (designed solely for overland liquid cargo transfer). Tides

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<sup>31</sup> U.S. Joint Chiefs of Staff, Joint Publication 4-01.6, G-5.

<sup>32</sup> *Ibid.*, VIII-2.

<sup>33</sup> *Ibid.*, XI-5. Sea state refers to the Pierson-Moskowitz scale, as shown in Joint Publication 4-01.6, Appendix G. A sea state of 5 equates to a maximum significant wave height of 12 feet and a maximum wind speed of 25.33 knots. A sea state of 7 equates to a maximum significant wave height of 40 feet and a maximum wind speed of 46.24 knots.

and tidal ranges also impact the positioning of causeways, as cargo transfer from lighters to causeways can often be more safely conducted beyond the surf zone.

Of all the physical conditions to be taken into account, though, weather and sea state are the most critical limiting factors. As the current Commander of the Military Sealift Command, Vice Admiral David L. Brewer III has noted that conflict doesn't wait for weather or advantageous sea conditions;<sup>34</sup> but JLOTS operations, which must take both safety and throughput requirements into account, must often wait for favorable weather and sea state conditions. Based on recommendations in joint doctrine, the maximum sea state for lighterage to perform cargo handling operations is 2.<sup>35</sup> Even if the JLOTS commander were tempted to continue lighterage operations beyond the maximum recommended sea state of 2, he would not be able to affect throughput, as the maximum mandated sea state for RRDFs, CWP's, and ELCAS to perform cargo operations is 2. A sea state greater than 2, then, severely limits where and when JLOTS operations can be conducted. No less significant, though, is the impact on the safety of both equipment and personnel. Even in the relatively calm conditions of sea state 2, JLOTS operators must install heavy dunnage such as packing material between an RRDF and a RO/RO ship's ramp to prevent excessive damage from wear and chafing.<sup>36</sup> With the operational tempo and the inherent danger of moving heavy cargo, such an ad hoc equipment configuration presents a significant hazard to all personnel involved in the operation. Use of heavy dunnage adds a trip hazard to the work area, and does not alleviate the potentially deadly danger of personnel getting caught between the RRDF and the RO/RO ship's ramp. Most troubling is that the use of heavy dunnage as a quick fix can become the accepted

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<sup>34</sup> Vice Admiral David L. Brewer III, "Military Sealift Command," Defense Transportation Journal (Washington D.C.: September 2004), 2.

<sup>35</sup> U.S. Joint Chiefs of Staff, Joint Publication 4-01.6, IV-16. From the Pierson-Moskowitz scale, a sea state of 2 equates to a maximum significant wave height of 3 feet and a maximum wind speed of 12.66 knots.

<sup>36</sup> Major Nathaniel R. Glover, "Logistics-over-the-Shore Operations," Army Logistician (Fort Lee: March/April 2001), 2.

standard, drawing attention away from the real need for substantial, long term fixes such as the standardization of RO/RO ships' ramps configuration or the acquisition of systems designed to reduce sea state (such as the Rapidly Installed Breakwater System, which will be discussed in the next section).

Force protection requirements pose another potential limiting factor on JLOTS operations. Though it is preferable to conduct JLOTS operations in a secure environment, the potential for future operations in a non-secure, hostile environment is real and raises additional challenges for the JFC and the JLOTS commander.<sup>37</sup> The JFC is responsible for the security of the LOA, including both the offshore and beach reception areas. Potential threats from naval forces, air strikes, ground attack, and chemical, biological, radiological, nuclear and high-yield explosives (CBRNE) attack drive defensive plans that impact force structure and mission-oriented protective posture (MOPP) levels.<sup>38</sup> Both force structure and MOPP level can significantly impact throughput. If assets are taken away from tasks directly related to throughput to provide force protection or if JLOTS personnel have to don personal protective gear that severely limits their level of physical activity, throughput rates will inevitably decline. JLOTS planners must ensure enough assets are in place to prevent throughput from falling to a level that would compromise the sustainment of forces, and ultimately, their mission.

Joint doctrine emphasizes the relationship of training to throughput in JLOTS operations: "The joint task force commander must appreciate the degree to which throughput can be degraded by inadequately trained or equipped forces. The JLOTS commander must be apprised of the training and materiel status of the JLOTS forces and make careful adjustments to anticipated

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<sup>37</sup> U.S. Joint Chiefs of Staff, Joint Publication 4-01.6, I-3.

<sup>38</sup> Ibid., J-4 – J-5.

throughput planning factors as necessary.”<sup>39</sup> In support of the critical relationship between training and throughput, Defense Planning Guidance calls for one liquid and one dry cargo JLOTS exercise annually; however, funding shortfalls and real world contingencies have led to numerous exercise cancellations.<sup>40</sup> Funding is a particularly troubling issue. USTRANSCOM programs for exercise funding (strategic lift, port handling, and inland transportation costs) and the Services program for unit participation funding; nonetheless, it is the JTFC and JLOTS commander who are ultimately dependent on the training and subsequent proficiency of the personnel provided to conduct JLOTS operations. With funding controlled by USTRANSCOM and the Services, the JTFC and JLOTS commander have little influence on when, where, or how training is conducted.

In addition to JLOTS training exercises being cancelled as a result of funding shortfalls and real world contingencies, the inherent personnel safety risks of JLOTS exercises can limit scheduling. Highlighting these safety risks, Vice Admiral Perkins recalls an exercise at Camp Pendleton while he was Commander, Military Sealift Command. In sea state 0,<sup>41</sup> twenty-five pieces of cargo were to be offloaded in-stream via RRDF and crane. Of the twenty-five pieces, three were lost over the side. Additionally, a sailor suffered a severe injury and lost his foot.<sup>42</sup> With such harrowing results to an exercise that was very limited in scope, the reluctance to conduct extensive JLOTS training is understandable. Nonetheless, JLOTS exercises are an invaluable tool in developing personnel proficiency and identifying limits to both throughput and safety. If training is not conducted, regardless of the reason, opportunities to improve JLOTS as a viable capability for CCDRs are lost.

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<sup>39</sup> Ibid., I-1.

<sup>40</sup> “Joint Logistics Over-The-Shore (JLOTS),” <<http://www.globalsecurity.org/military/ops/jlots.htm>> (30 November 2005), 3.

<sup>41</sup> U.S. Joint Chiefs of Staff, *Joint Publication 4-01.6*, Appendix G. From the Pierson-Moskowitz scale, a sea state of 0 equates to a maximum significant wave height of 0.15 feet and a maximum wind speed of 2.83 knots.

<sup>42</sup> Perkins interview, 11 January 2006.

The incompatibility of some JLOTS equipment represents another limitation to both throughput and safety. Joint doctrine clearly warns JLOTS planners, “It is important to be aware that Navy and Army causeway/lighter systems are not always compatible.”<sup>43</sup> Examples abound: the ELCAS 140-ton crane cannot completely unload an LCU-2000 without the craft shifting position; the LSV cannot discharge containers to the ELCAS; some combinations of lighters and beach transfer systems cannot be used for container transfer at the beach;<sup>44</sup> the Rough Terrain Container Handler (RTCH) cannot offload containers from the LCU-1600 or the LCU-2000 because the ramp openings on these LCUs are not wide enough to allow a twenty foot container to pass through.<sup>45</sup> Each of these examples has obvious throughput implications. Operators may be forced to use only certain combinations of equipment, which may or may not be readily available in the LOA, or operators may be forced to develop work-arounds. The work-arounds are not only likely to reduce throughput, but also cause safety hazards (e.g., the use of heavy dunnage between RO/RO ships’ ramps and RRDFs described above). To mitigate the risk to throughput and safety, planners should identify equipment incompatibilities as early as possible in the planning process. If possible, compatible assets should be identified and brought into the LOA as substitutes.

### **Ongoing Efforts to Overcome JLOTS Limitations**

Several ongoing acquisition programs warrant the attention of CCDRs and JLOTS planners, as they soon may provide material solutions to some of the throughput and safety problems imposed by physical conditions in the LOA and equipment incompatibility. As noted in the mission deficiency section of the 1997 JLOTS Support Systems Mission Need Statement: “Services cannot meet cargo throughput requirements using existing LOTS systems due to severe degradation of

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<sup>43</sup> U.S. Joint Chiefs of Staff, Joint Publication 4-01.6, VI-15.

<sup>44</sup> *Ibid.*, VII-2.

<sup>45</sup> U.S. Joint Chiefs of Staff, Joint Publication 4-01.6, VIII-2.

throughput in sea state 3;<sup>46</sup> current LOTS assets do not optimize interoperability between the Services; the inability of specific LOTS/JLOTS systems, subsystems, ships, and interfaces to provide safe, sustained operations through sea state 3 effectively halts sustainment throughput to forward deployed forces.”<sup>47</sup> As a result, several acquisition programs have been undertaken to overcome these limitations. Rotary wing aircraft such as the CH-53X and MV-22 offer the capability to operate in excess of sea state 3, but are limited in load carrying capability to deliver sufficient throughput by themselves.<sup>48</sup> Various high speed vessels, such as the Theater Support Vessel (TSV), are in various stages of the acquisition process. The primary advantage of the TSV is high speed operational movement and maneuver, enhanced by the capability to move personnel and their equipment together, limiting the need for large scale reception, staging, onward movement, and integration (RSOI). As a result, the risk of beach clearance becoming a bottleneck to JLOTS throughput is minimized. The TSV offers lift capability through sea state 5.<sup>49</sup> Other innovative acquisition programs aimed at addressing the sea state problem include the Rapidly Installed Breakwater System (RIBS) and the auto-compensating crane. RIBS is designed to augment existing port facilities, enabling greater throughput in a safer environment, by reducing sea state 3 conditions to sea state 2 or less upon installation.<sup>50</sup> The auto-compensating crane would address safety issues resulting from sea state and compatibility issues, facilitating ship and beach cargo transfer operations by compensating for movement between platforms. While the CH-53X, MV-22, TSV, RIBS, and auto-compensating crane are in various stages of the acquisition process, CCDRs

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<sup>46</sup> U.S. Joint Chiefs of Staff, Joint Publication 4-01.6, Appendix G. From the Pierson-Moskowitz scale, a sea state of 3 equates to a maximum significant wave height of 5 feet and a maximum wind speed of 16.35 knots.

<sup>47</sup> U.S. Chief of Naval Operations (N81), Joint Logistics Over-the-Shore (JLOTS) Support Systems Mission Need Statement (MNS), 3-4

<sup>48</sup> Lorenzo Cortes, “Navy Transformation Roadmap Mentions R&D Directed at Heavy Lift LCAC,” Defense Daily (Potomac: 7 May 2004), 1.

<sup>49</sup> “Army Watercraft,” Army (Arlington: 2005), 3.

<sup>50</sup> Ibid.

and JLOTS commanders have a vested interest in their status. Each program holds the potential to mitigate some of the throughput and safety risks that currently limit JLOTS capability.

Training limitations adversely affect personnel proficiency and increase the risk that sufficient levels of throughput and safety cannot be achieved in a JLOTS operation. Currently, training limitations are being addressed via material and non-material alternatives that CCDRs could leverage to improve personnel proficiency. One promising material alternative is the Vessel Bridge Simulator, an Army trainer that uses computer-generated imagery to replicate Army watercraft maneuvering and navigation in various ports throughout the world. Weather, lighting, and various real-world variables can be manipulated to prepare mariners for potential contingencies.<sup>51</sup> The importance of conducting training in a real-world environment is emphasized in the non-material solution, as well. The National Training Center (NTC) at Fort Irwin, California, is the Army's primary training facility for brigade and battalion sized units. Units that rotate through NTC can begin their training prior to arrival by moving their equipment to NTC via LOTS operations. As conducted in Exercise Turbo Patriot in September 2000, units can perform LOTS at Marine Corps Base Camp Pendleton, and then move both personnel and equipment on to NTC.<sup>52</sup> Scheduling, weather, and sea state can present obstacles to this kind of training; nonetheless, it presents an opportunity for realistic LOTS training that complements training events already scheduled at NTC.

## **Recommendations**

Two of the limitations addressed above – equipment compatibility and training – can be traced to the decentralized, Service-centric approach taken toward JLOTS. Because both the Army and the Navy maintain independent, organic LOTS capabilities, and because JLOTS has evolved

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<sup>51</sup> Ibid..

<sup>52</sup> Gary C. Howard and Gregory K. Johnson, "Realistic Training for Power Projection," Army Logistician (Fort Lee: May/June 2002), 1.

from those capabilities, it is not surprising that limitations in equipment compatibility and training have persisted. By statute, the Service Chiefs are to organize, train, and equip their forces, while the CCDRs are to employ and fight with those forces to implement the President's policies. Problems can arise if CCDRs demand forces and resources for purposes the Service Chiefs may not totally support. These problems can be exacerbated by the fact that CCDRs have limited control of their budgets, which ultimately come out of Service budgets.<sup>53</sup> If CCDRs are to have better control of a more robust JLOTS capability that is more joint and less Service-centric, they must have centralized control of funding for JLOTS. Because of its role as the manager of DTS, USTRANSCOM is the obvious choice for CCDR centralized control. It can be argued that USTRANSCOM already has this control, as it is responsible for joint acquisitions and exercises related to JLOTS; however, Service-specific LOTS acquisition programs persist, and the Services still control funding for unit participation in JLOTS exercises. As a result, CCDRs have a limited ability to influence two of the factors (equipment compatibility and training) that profoundly impact the throughput and safety of JLOTS operations they may have to conduct.

To gain greater control of funding for JLOTS, geographic CCDRs must clearly identify limitations to their current JLOTS capability in their contingency operation plans (OPLANs). Additionally, they must show the critical role of JLOTS in mission accomplishment. Specifically, Annex D (logistics) for each OPLAN should include an assessment of JLOTS feasibility – a determination if JLOTS should be used as an effective tool in accomplishing the mission. As this feasibility assessment is completed for each OPLAN within a geographic CCDR's AOR, an overarching analysis of potential JLOTS sites could be generated, ranking feasibility and risks in terms of the physical conditions of potential LOAs, the level of training required for personnel to

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<sup>53</sup> Tom Clancy, with General Tony Zinni (USMC, retired) and Tony Kolz, Battle Ready (New York: G.P. Putnam's Sons, 2004), 324.

achieve throughput requirements within those LOAs, and the equipment compatibility requirements to facilitate the operation. While generating such an all-encompassing JLOTS feasibility assessment for an expansive AOR seems daunting, it would highlight to the Secretary of Defense and the Chairman of the Joint Chiefs of Staff during OPLAN review how the CCDR's mission is at risk due to JLOTS shortfalls. Furthermore, developing a JLOTS feasibility assessment is not totally without precedence. The 1997 JLOTS Support Systems Mission Need Statement was supported by the Navy's Environmental Requirements Study, a JLOTS-focused analysis of worldwide weather and sea state conditions that dramatically indicated that in some geographic CCDR AORs sea state 3 conditions existed 50 percent of the time;<sup>54</sup> thus, 50 percent of the time, JLOTS was not an option in these AORs. If similar findings were clearly presented in planning documents, identifying the potentially stark limitations of the JLOTS capability, CCDRs could make a much stronger case to gain further control of funding for JLOTS acquisition programs and training. Even if CCDRs did not gain such control, the greater visibility of JLOTS limitations would undoubtedly force the Services to re-think their approach to JLOTS.

It could be argued that the administrative burden attached to developing JLOTS contingency plans for each current OPLAN, and then expanding to include JLOTS contingency plans for entire AORs, would be an overwhelming staff requirement that would be a distraction to other logistics planning and of limited value to the CCDR. The staff work could be separated from ongoing logistics planning by permanently assigning a JLOTS commander with a small supporting staff, including a beach Reconnaissance Officer,<sup>55</sup> that would focus strictly on JLOTS planning. The

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<sup>54</sup> U.S. Chief of Naval Operations (N81), Joint Logistics Over-the-Shore (JLOTS) Support Systems Mission Need Statement (MNS), 3.

<sup>55</sup> Glover, "Logistics-over-the-Shore Operations," 4. Glover recommends authorization of a beach reconnaissance officer on the terminal battalion modification table of organization and equipment. He points out that the beach reconnaissance officer should have extensive knowledge of LOTS.

compilation of extensive data on LOA physical conditions and corresponding training and equipment requirements would not only benefit CCDRs in fighting for funding, but would also provide comprehensive JLOTS contingency planning in OPLANs that could be readily used for Crisis Action Planning.

## **Conclusion**

Based on the United States' strategy in combating GWOT and current global threats, JLOTS is a critical capability that could greatly enhance Combatant Command mission accomplishment by increasing the ability to project and sustain forces in austere, potentially hostile environments. Despite its importance, though, JLOTS effectiveness is limited by throughput and safety issues that are a function of physical conditions of the LOA, potential force protection requirements, training levels, and equipment compatibility. Several acquisition programs and training concepts have been undertaken to mitigate the limitations on JLOTS, but further progress is needed to fully realize the potential JLOTS capability. Three recommendations have been offered to advance the JLOTS capability. First, funding authority for JLOTS acquisition programs and training should be centralized under USTRANSCOM. This would align resources and responsibilities for JLOTS among the CCDRs, who ultimately have to execute JLOTS. With their joint focus, CCDRs would

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be better able address the equipment compatibility and training issues that currently hinder JLOTS throughput and safety. Second, to make the case for funding authority, CCDRs should clearly identify the current limitations and risks associated with JLOTS. Each CCDR should leverage the OPLAN process to develop a comprehensive JLOTS feasibility assessment for his AOR, ranking risks posed by physical conditions of LOAs, the level of training required to achieve throughput and safety requirements within those LOAs, and the equipment compatibility requirements to facilitate the operation. By using planning documents to identify the potentially stark limitations of the current JLOTS capability, CCDRs could point to hard evidence of the need for greater focus on JLOTS, making a persuasive case to gain centralized control of JLOTS funding. Third, to accomplish staff work associated with the development of an overarching JLOTS feasibility assessment, a JLOTS commander with a small supporting staff should be permanently assigned to the CCDR's staff under the J4. This would enable development of the feasibility assessment without detracting from ongoing logistics planning. Taken together these steps would enable CCDRs to greatly improve JLOTS throughput and safety, and ultimately expand JLOTS capability.

## **List of Acronyms**

AOR – area of responsibility  
BCU – beach clearance unit  
CBRNE – chemical, biological, radiological, nuclear, and high-yield explosives  
CCDR – combatant commander  
CF – causeway ferry  
CSNP – causeway section, non-powered  
CSP – causeway section, powered  
CWP – causeway pier  
DTS – Defense Transportation System  
ELCAS – elevated causeway system  
GWOT – Global War on Terror  
IPDS – inland petroleum distribution system  
JFC – joint force commander  
JLOTS – joint logistics over-the-shore  
JTFC – joint task force commander  
LARC-V – lighter, amphibious re-supply, cargo, 5 ton  
LCAC – landing craft, air cushion  
LCM – landing craft, mechanized  
LCU – landing craft, utility  
LOA – logistics over-the-shore operation area  
LOTS – logistics over-the-shore  
LSV – logistics support vessel  
MOPP – mission-oriented protective posture  
MSC – Military Sealift Command  
NTC – National Training Center  
OPDS – offshore petroleum discharge system  
RIBS – rapidly installed breakwater system  
RO/RO – roll-on/roll-off  
RRDF – roll-on/roll-off discharge facility  
RSOI – reception, staging, onward movement, integration  
RTCH – rough terrain container handler  
SLWT – side loading warping tug  
T-ACS – auxiliary crane ship  
TSV – theater support vessel  
USTRANSCOM – United States Transportation Command

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