

NAVY EXPEDITIONARY LOGISTICS

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ABSTRACT

Continuous process improvement has been widely taught in business schools and has yielded real results and success in both for-profit and non-profit sectors. Though there have been many cases developed for use in business schools, few, if any, situate the topic in a military context. Further, expeditionary logistics presents managers with special problems of being removed from their supporting enterprise systems that process, track, and/or control of such logistical elements as purchase orders, inventory, distribution, receivables, and fulfillment. We present a case in a military setting that exposes students to the challenges of expeditionary logistics and takes them through the fundamentals of process analysis and process improvement.

Keywords: Expeditionary logistics, process analysis, continuous process improvement, military logistics.

INTRODUCTION

In recent decades, the U.S. has increasingly engaged in conflicts involving non-state actors, and it appears that these conflicts are unlikely to subside in the foreseeable future. As a powerful maritime force, the Navy plays a critical role at sea and on land in these conflicts through its expeditionary warfare and explosive ordnance disposal (EOD) capabilities that are deployed far from the established Naval supply and distribution channels.

The purpose of this case is to introduce process analysis and continuous improvement to students in the context of military expeditionary logistics for a Navy explosive ordnance disposal (EOD) unit. The case explores questions of business process alignment, information system support of business processes, training, value-added versus non-value-added activities, process visibility, and the application of lean concepts in the context of expeditionary logistics. The case is supported by a teaching note that can be used by the instructor to lead students through a series of questions and an in-depth process analysis to uncover redundancy, non-value-added activities, and service gaps in the expeditionary logistics process. Assignment and case discussion questions include leading students through a process of defining expeditionary logistics and identifying how it differs from traditional, commercial logistics. From there, students are introduced to process mapping as a continuous improvement tool and are asked to analyze the description of the item fulfillment process in the case and then develop a process map that translates the description into visual flows and decisions. Students are then introduced to cause and effect analysis and fishbone diagrams and are taken through a process of systematically uncovering root causes of problems faced in the expeditionary logistics operations of the explosive ordnance disposal (EOD) units. Finally, students are tasked with developing an improvement plan for the EOD commander. This plan is to specifically address current shortcomings described in the case and the necessary improvements in

people, processes, and technology necessary to conduct logistics support that is fast, repeatable, and sustainable in an expeditionary setting.

This case describes in detail the logistical processes being used by Explosive Ordnance Disposal (EOD), a representative unit of Navy's expeditionary operations. By studying and analyzing this case, students develop an appreciation of the challenges faced in managing materiel fulfillment in the context of expeditionary logistics as well as how expeditionary logistics differs from traditional commercial logistics.

The complete case and its teaching note are available upon request while a summary of both is provided below. Specifically, we introduce sections from the case that provide background and context as well as establish the motivation for process improvement. We also provide examples of case exhibits and teaching note materials used for leading the case wrap-up discussion.

INTRODUCTION

Lieutenant Pat Daly just checked into Explosive Ordnance Disposal Expeditionary Support Unit One (EODESU-1) in San Diego, California for the beginning of a two-year assignment. The EODESU-1 plans, coordinates, integrates, synchronizes, and provides total logistics support for its higher headquarters, the Explosive Ordnance Disposal Group One (EODGRU-1), and the subordinate units that are preparing for, or are in, a deployed status. The ESU command structure is broken down into seven departments with specific functions: administrative, operations, civil engineering support equipment, supply, craft, materiel, and medical (see Exhibit 1). Each department provides a specific support capability to EODGRU forces. The items an explosive ordnance disposal (EOD) unit needs to operate during training and deployment are managed by the supply department and materiel department. The supply department is the principal financial, procurement, inventory, and customer service manager within the command. The supply and materiel departments maintain separate warehouses; the supply department manages personal gear issue (PGI) items (Exhibit 2) and the materiel department manages table of allowance (TOA) gear (see Exhibit 3).

Having recently come from an aircraft carrier, Lieutenant Daly knew there would be a steep learning curve since the explosive ordnance disposal (EOD) community was known for an intense focus on getting things done and doing whatever it takes to achieve the mission. Lieutenant Daly assumed there would be some things in common such as requisition processes and information systems but the culture of the organization was the part of the job that seemed most uncertain.

The Explosive Ordnance Disposal (EOD) Supply Organization

Navy EOD units are unique in the sense that they are the only military force capable of both parachuting in from the air and diving under the sea to disarm weapons. There are a total of two EOD organizational groups (EODGRU): EODGRU ONE is in San Diego, California (Naval Amphibious Base, Coronado); EODGRU TWO is in Virginia Beach, Virginia (Joint Expeditionary Base, Little Creek). Each group is comprised of five units: Mobile Units (EODMU), Mobile Dive and Salvage Units (MDS), Training and Evaluation Units (EODTEU), Operational Support Unit, and Expeditionary Support Units (ESU).

It is now Monday and a request for EOD forces has been generated for the CENTCOM AOR (Exhibit 3-1). A Force Tracking Number (FTN) has been identified by the Navy and assigned to EODGRU ONE. The FTN describes the details of when, what, where, and how many people are needed to accomplish the current mission. The primary mission in this case is to counter IED operations.

EODGRU ONE has accepted the task order and has assigned it to EOD Mobile Unit Y. Mobile Units (MU) provide deployable command and control (C2) combat units for electronic ordnance disposal, counter-IED (Improvised Explosive Device), and diving and salvage operations to joint, naval, and combined task force commanders. Each mobile unit is capable of deploying independently or as an imbedded force with other services or commands. There are 8-10 platoons within each mobile unit, and each platoon is composed of 6-8 EOD techs. EOD Mobile Unit Y is responsible to assign a platoon with the right capabilities for the task. All platoons routinely undergo a repetitive training cycle to ensure readiness and familiarity with equipment before they are ready to be deployed.

Lieutenant Daly's boss, Commander Abrell, is eager to get the newest officer on the team trained and leading a team. Deployments have accelerated dramatically over the last 18 months and there have been chronic delays in gear issue, replacement, and turn-in. There have also been increasing problems with morale and staff burn-out as overtime has increased significantly. During the first week, Lieutenant Daly was taken through the parts of the command that are critical to sustaining forces in the field so that missions are completed effectively.

The Supply and Materiel Departments

The logistics function inside EODESU ONE manages two important departments: supply and materiel. Inside the supply department, the logistics specialists use R-Supply to manage financial and requisition data, and WASP (a commercial off-the-shelf system) to manage the warehouse inventory. Prior to WASP they used Microsoft Excel as their primary inventory management system. To improve efficiency and inventory accuracy, WASP was adopted by the command as the primary inventory management system. WASP is not part of the Navy program of record and is a non-networked local system that does not communicate nor allow asset visibility outside the command. The roles and information systems for these two departments are summarized in Exhibit 4.

The supply department's primary source for acquiring all PGI gear is the NECC's Central Issuing Facility (CIF). The CIF provides central management by using a web-based automated system that keeps track of gear requisitions. The CIF operates on a walk-in first-come first-serve basis and the average time to fulfill a requisition requirement is typically between two and four weeks. The process initiated when the supply personnel prepare a requirement request document and then transport the document to the closest Central Issuing Facility. To date, there are two CIF locations: one is in Port Hueneme, California—roughly 450 miles away from EODESU ONE in Coronado, California—and the other is in Virginia Beach, Virginia. Due to 450-mile distance from the CIF, EODESU ONE must maintain large quantity of PGI gear onsite to improve customer wait time and ensure readiness but at higher inventory cost.

The materiel department is controlled mostly by non-supply rated EOD technicians who use a system called WASP as their primary inventory management system. WASP is a stand-alone commercial off-the-shelf inventory management software implemented in 2010 and serves as EODESU's primary inventory and warehouse management system. WASP is a non-networked local system that does not allow asset visibility outside the command. It does come with some useful capabilities such as a barcode scanner, barcode labeling software, and basic inventory / asset tracking that allows EODESU to manage its inventory much more efficiently. Prior to WASP, the primary method used to manage inventory was through spreadsheets. To ensure readiness, NECC also requires the command to maintain an adequate inventory through the Readiness and Cost Reporting Program (RCRP) and from end user feedback.

RCRP is a readiness reporting system that provides NECC forces with a standardized, enterprise-wide capacity to measure, display, and report the readiness status of personnel, equipment, supply, training, and ordnance. Now that Lieutenant Daly was familiar with these two important departments it was time to understand the gear issue, replacement, and turn-in processes.

Gear Issue

PGI and TOA gear is assigned a year out from deployment. This gives the assigned platoon an opportunity to train with their assigned equipment. Mobile units tell the ESU what they need for deployment. They go to either the supply or material department to submit requirement request using a manually generated DD Form 1149 (Requisition and Invoice/Shipping form). Each department would then check its system (WASP) for the items they may have in stock. If a special requirement arises for a non-carried piece of equipment, the ESU can appropriate the material to fulfill the requirement using various procurement methods. These include NSN requisitions through the navy supply system and open purchases using GCPC.

The NSN requisition process is quite simple. When a logistical specialist using R-supply generates a requisition and electronically releases it to the Navy supply system for fulfillment; the obligated funds are automatically subtracted from the commands' total budget. Once the requisitions are received at the Navy's warehouse, R-supply automatically assigns them a location either for stocking in the warehouse or for issuing to the respective department.

Contracting support is provided by NAVSUP Feet Logistical Center San Diego or Norfolk. A Contracting Review Board (CRB) is held at Naval Expeditionary Combat Command (NECC) N41 to validate the requirement. Any single purchase over \$3,000, or for a period of performance greater than 90 days, will require a contract to go through the contracting department. To initiate an open purchase, logistics support obligates funds in R-Supply to the Government credit purchase card (GCPC) line of accounting or the contract line of accounting and the commercial source is paid using a GCPC. Once the product is received from the vendor, it is confirmed in R-supply and is manually entered into the WASP inventory management system. From that point onwards, all tracking, issuing, and inventorying is maintained until ready for issue. When compared to standard fleet requisition processes, the expeditionary requisitions processes are unique: over 95% of the fleet requisitions are filled through the Navy supply system using NSN, and less than 5% are open purchases. Whereas, in expeditionary logistics approximately, 70% of the requisitions are open purchases and only 30% are NSN requisitions [1].

The Training Cycle

During the training cycle, if the gear gets damaged, lost, or consumed, the designated team member or an individual goes back to the ESU for replacement gear. Replenished, damaged, or lost items will be replaced through a one-for-one turn-in process or survey process using a DD Form 200 (Financial Liability Investigation of Property Loss). Broken or damaged gear is brought back to the appropriate department at ESU for replacement from stock through what is referred to as a *one-for-one turn-in process*. After the replacement, the appropriate department either repairs or requests replacement of the item to get it ready for reissue. If an item is lost, the appropriate team fills out a DD Form 200 as part of the *survey process*. In the form, the team explains the situation and obtains approval through its chain of command to replace the item. Based on the cost or classification of the item an investigation may be

required prior to replacement. All items above \$2,000, weapons, or classified equipment require an investigation prior to replacement.

The Deployment Cycle

Deployed Mobile Units are responsible for maintaining their gear and inventory using DD Form 1149 as their primary inventory document. As items are damaged, lost, or deteriorate through normal use, the Mobile Unit is responsible for notifying the Expeditionary Support Element (ESE) officer in charge who is a Navy Supply Corps officer. The ESE serves as a small-scale element of an ESU that is integrated with Mobile Units and provides forward support. In theater, the ESE procurement process is slightly different from stateside. The goal is always to provide a wide range of support whether organic or outsourced through the fastest means possible. GCPC single purchase limits may be increased with proper approvals. The same one-for-one exchange or survey process for replacement items used during training still applies during deployments. If compatible, local supplies or resources are procured using the GCPC. If the local environment does not have a compatible replacement, the ESE will reach back to the ESU in the U.S. to initiate the standard procurement process; this is referred to as *garrison reach-back*. Once the item is procured, the EODESU ships the item to the deployed unit using DHL delivery service.

The Problem: Go Faster, Do More

After its deployment, EOD Mobile Y must return equipment taken for their mission. The Mobile Unit has ten internal helicopter slingable container units (ISUs) full of dirty, beaten gear. The PGI equipment is returned to the supply department for reconditioning and reissue. A loss of 30-35% of the total equipment occurred during the deployment which is typical. All TOA supplies are returned to the material department. The entire return of equipment to the supply and materiel departments is referred to as the reconciliation process, during which a Form 1149 Requisition and Invoice/Shipping Document is verified against the electronic records WASP. During the reconciliation process, the TOA gear goes through Expeditionary Logistics Overhaul (ELO). This is similar to the Integrated Logistics Overhaul (ILO) process that happens on board ships when they enter an overhaul period. During this process, the materiel department identifies the gear that needs to be repaired, reconditioned, or replaced. EOD techs have the capability to repair and recondition TOA gear. Damaged materiel is immediately processed for either repair or replacement to get ready for the next deployable platoon. Any items that are missing or beyond repair require a survey document (DD Form 200) to be submitted to the supply department for procurement.

As EOD Mobile Unit Y is returning and going through the reconciliation process, Mobile Unit Z is preparing to deploy. Lieutenant Daly has been told by Commander Abrell that overtime hours for the civilian workforce comprising 40% of the command are unacceptable and future budgets will not support it. Further, morale is low due to the long hours put in by the uniformed personnel who receive no overtime compensation for time worked beyond 8 hours per day. Given Lieutenant Daly's "fresh eyes" on the matter, Commander Abrell has asked for a report to be delivered in one week with a set of initial recommendations for improving the processes in place at EODESU-1. Specifically, Commander Abrell would like to reduce redundancy in processes, increase the speed and responsiveness of expeditionary logistics support to deployed and training units, and to "lean out" the entire expeditionary logistics process. Lieutenant Daly is asked to frame all observations within a framework of "people, process, technology" and identify problems and recommendations based upon observations.

REFERENCES

- [1] Kundra, S., Brown, L., and Donaldson, C. Assessment of logistical support for expeditionary units. Master's Professional Report, Naval Postgraduate School, Monterey, California, 2014, 77 pp.

Exhibit 1

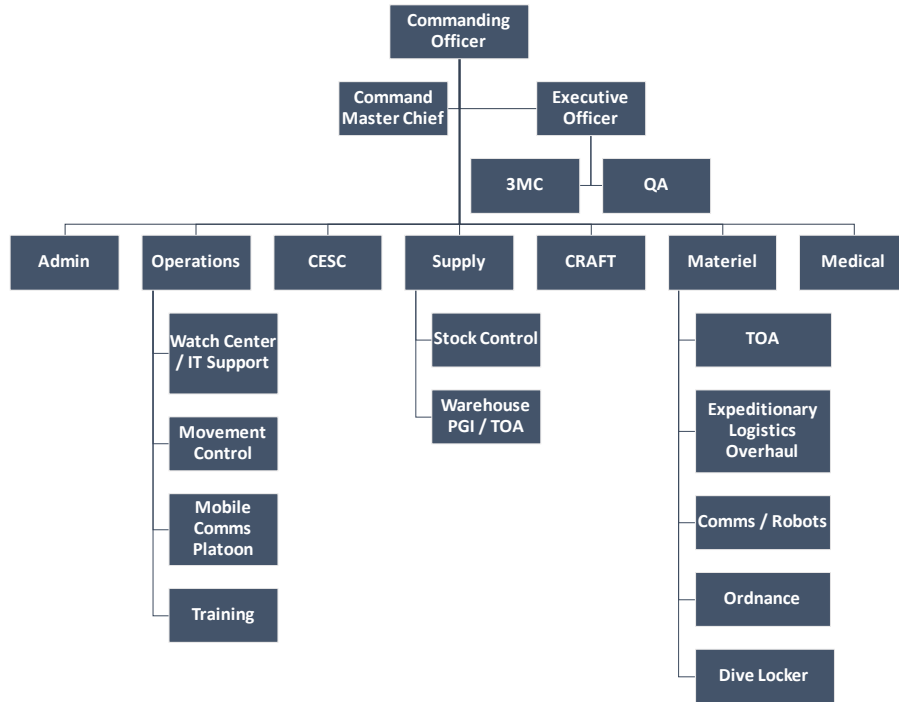


EXHIBIT 2 – Sample PGI Issue Items

COG	NSN	DESCRIPT	UI	QTY	WEIGHT	CUBE(CF)	NSN EXT	ASSY EXT
9ED	4240-01-361-1319	CANISTER CHEMICAL-BIOLOGIC	EA	2	0.1	0.0766	25.62	15141.42
ONC	4240-LL-LCX-0109	MASK CHEMICAL-BIOLOGICAL	EA	1	2	0.7653	600	354600
ONL	8415-LL-LCX-0002	COAT CHEMICAL PROTECTIVE	EA	2	6.56	0.7776	232.8	137584.8
ONL	8415-LL-LCX-0003	TROUSERS CHEMICAL PROTECT	PR	2	7.8	2.6666	276.84	163612.4
ONL	8415-LL-LCX-0004	GLOVES NUC-BIO-CHEM CONTA	PR	2	0.9	0.0198	51.74	30578.34
ONL	8415-LL-LCX-0005	GLOVES INSERTS NUC-BIO-CHE	PR	2	0.5	0.0182	10.98	6489.18
ONL	8430-LL-LCX-0006	OVERBOOT LIGHTWEIGHT NUC-	PR	2	3.5	0.8312	71.84	42457.44
9BD	8465-00-860-0256	COVER CANTEEN WATER OLIVE	EA	1	0.25	0.0364	5.89	3480.99
9BD	8465-01-115-0026	CANTEEN WATER PLASTIC 1QT	EA	1	0.5	0.0781	5.25	3102.75
9BD	8465-01-322-1965	BELT INDIVIDUAL EQUIPMENT	EA	1	0	0	14.45	8539.95
9BL	8465-01-500-5485	BAG NUCLEAR BIOLOGICAL & C	EA	1	4	1.546	107.87	63751.17
9BL	6545-01-566-4797	INDIVIDUAL MEDICAL ASSAULT	EA	1	2	0.0954	224.53	132697.2
9BD	8470-01-534-0777	CARRIER, SMALL ARMS PROTEC	EA	2	2	0.1852	625.24	369516.8
9BW	8470-01-540-6532	INSERT SMALL ARMS-INSERT, S	EA	2	4.5	0.0554	496.72	293561.5
ONL	8470-LL-LCX-0011	INSERTS ESAPI	EA	2	0	0	1015	599865
ONL	8470-LL-LCX-8109	MAR-CIRAS KIT INCLUDING SOF	KT	1	0	0	2300	1359300
9BL	5855-LL-LCC-9024	MOUNT NVG 1HOLE G37 TAN	EA	1	0	0	639.28	377814.5
9BH	6220-01-549-4184	LIGHT F/HELMET (RED-WHITE-B	EA	1	0.5	0.0065	0	0
9BD	8415-01-524-5842	BAND HELMET CAMOUFLAGE (F	EA	2	0	0	1.88	1111.08
ONW	8415-LL-LCX-0137	COVER HELMET NAVY WORKING	EA	1	0	0	13.14	7765.74
ONW	8415-LL-LCX-0138	COVER HELMET NAVY WORKING	EA	1	0	0	13.14	7765.74
9BW	8470-LL-LCX-8087	HELMET, GROUND TROOPS ECH	EA	1	5	0	733.65	433587.2
ONL	8125-LL-LCC-4312	BOTTLE WIDE MOUTH 32OZ. LO	EA	1	0.5	0.1446	9.5	5614.5
ONL	8125-LL-LCC-4319	PARK WATER BOTTLE 1 LITER D	EA	1	0.25	0.2083	20	11820

EXHIBIT 3 – Sample TOA Issue Items

NSN	DESCRIPTION	UI	QTY	WEIGHT(LB)	CUBE(CF)	NSN EXT COST
8340-LL-LCC-2986	BOOT TENT SIDE DOOR TO DOME DOOR OD SERIES 100-300	EA	1	19	3.3541	535
8340-LL-LCC-4426	FLOOR TENT 9.5X25FT GRAY F/BX 105 TENT READY FOLD	EA	1	200	12.5	2240
8340-LL-LCC-6215	FLOOR TENT FOR CONNECTOR BOOT DOME TO NON-DOME	EA	1	5	0.3333	42.75
3990-LL-LCC-3885	JACK LEVELING KIT AAR	EA	8	0	0	25345.2
4510-LL-LCC-2901	EISU-90 LATRINE 6 HEAD AAR	EA	1	6985	495	90687.9
6150-LL-LCC-4597	CABLE POWER TWISTLOCK 30A 100FT AK	EA	2	32	10.5	618
5430-LL-LCC-3876	TANK PILLOW WATER 1000 GAL	EA	2	180	1080	4066
6780-LL-LCC-3745	HOSE DRAIN/WASTE 30FT (AAR)	EA	1	0	0	398.44
2930-LL-LCC-3750	PUMP WATER GRAY AAR	EA	1	0	0	806.37
3990-LL-LCC-3885	JACK LEVELING KIT AAR	EA	8	0	0	25345.2
5430-LL-LCC-3876	TANK PILLOW WATER 1000 GAL	EA	2	180	1080	4066
4510-LL-LCC-2900	EISU-90 SHOWER 6 HEAD AAR	EA	1	6800	495	85966.61
6150-LL-LCC-4597	CABLE POWER TWISTLOCK 30A 100FT AK	EA	2	32	10.5	618
6780-LL-LCC-3746	HOSE SHOWER GRAY WATER WASTE EISU90 (AAR)	EA	1	0	0	221.76
2930-LL-LCC-3750	PUMP WATER GRAY AAR	EA	1	0	0	806.37
2840-LL-LCC-3753	GENERATOR SYSTEM ISO BICON MOUNTED 60KW	EA	1	14000	564	136894

EXHIBIT 4 – EOD Supply and Materiel Departments: Roles and Information Systems

EOD Supply Department	EOD Materiel Department
PGI Gear	TOA Gear
Operated by supply personnel	Operated by non-supply personnel
ROLES	
Stock Control	Issue and process returns of TOA gear to warehouse
Budgeting	Logistical overhaul of TOA gear
Inventory requisition	
Financial reporting	
INFORMATION SYSTEMS USED	
R-supply Financial data Requisition data	RCRP Measures, displays, reports readiness status of: - Personnel - Equipment - Supply - Training - Ordnance
WASP - Warehouse management - Inventory management	
Navy Supply System - NSN requisition	
Government Credit Card (up to \$3,000) - Open purchases	