Coastal Logistics., Inc. - Establishing Third Party Logistics Services

By

E. Powell Robinson, Jr.
Associate Professor

and

Anthony D. Ross
Assistant Professor

of:
Texas A&M University

LOGISTICS CASE STUDY

DEVELOPED FOR:

COUNCIL OF LOGISTICS MANAGEMENT

COASTAL LOGISTICS INC., - ESTABLISHING THIRD PARTY LOGISTICS SERVICES

ABSTRACT

This case places the reader in the middle of startup operations at Coastal Logistics Inc. (CLI), a provider of logistics services to offshore petroleum platform operators in the Gulf of Mexico. Where traditionally, each petroleum company provides logistics services in-house, CLI proposes to establish itself as a third party logistics services provider. CLI claims that by consolidating logistics operations for multiple petroleum firms, it can lower logistics costs through 'resource sharing'. The case challenges the reader to evaluate the economic feasibility of the resource sharing concept, determine whether CLI should proceed with plans to establish itself as a major logistics service provider in the Gulf of Mexico, and to establish an implementation plan, should CLI decide to pursue this new venture.

PROBLEM DEFINITION

Joe Ross, director of business development for Coastal Logistics Inc. (CLI), looked up from the cargo manifest when he heard Miss Ellie sound off, announcing her departure for the Eugene Island Area of the Gulf of Mexico. Several members of Affiliated Oil Company's (AOC) logistics staff had just left Joe's temporary office at the Morgan City shore base. For most of the afternoon, and well into the night, they had explored a proposal that would, with AOC's help, establish CLI as a third party provider of marine logistics services in the Gulf. The proposal represented a radical departure from AOC's current logistics strategy of servicing its own platforms. Not only did the proposal call for the transfer of AOC's logistics assets to CLI, but it would create a new philosophy for logistics operations. Joe knew that by the time Miss Ellie returned from her three-day delivery route, he would have either clenched the deal, and be celebrating with a large bowl of gumbo at the Crawfish Cavern, or be on his way back to corporate offices in Cleveland.

Joe returned his attention to Miss Ellie's cargo manifest. On this route, she utilized 55 % of her outbound deck space and 30 % of her bulk cargo capacity. These load factors were typical of supply boats operating in the Gulf of Mexico, and played a key role in CLI's proposal to establish itself as a third party supplier of logistics services in the region. Joe poured himself another cup of coffee and settled in among the stacks of manifests, maps, boat routes, and other operational data. It was going to be a long night, but by tomorrow afternoon's meeting he had to clearly demonstrate the economic benefits of asset sharing and come up with an implementation plan for establishing CLI as a logistics service provider. Joe knew that, although they all agreed in principle, this would be his best chance to convince AOC's logistic team that the numbers were right and that it could be pulled off. He couldn't afford to blow it.

COMPANY OVERVIEWCOMPANY OVERVIEWCOMPANY OVERVIEWCOMPANY OVERVIEW

The offshore oil industry is composed of several major oil companies, such as AOC, and a multitude of smaller, independent operators. Once an oil field is targeted for development, the oil company identifies exploration drilling sites, often 20-100 nautical miles from shore, and constructs drilling platforms. If exploration activities are successful, the platform is converted into a production platform to extract crude oil and natural gas. Otherwise, the platform is moved to another site to continue exploration

Like its competitors, AOC traditionally focused on exploration and production activities, paying little attention to operating costs. However, flat oil prices since the 1986 crash and rapid cost increases since 1990 pushed the need to control operating costs to the forefront. Logistics costs account for approximately 16 percent of total operating costs, making this a significant area for generating cost savings. In 1996 AOC spent $1.0 million for shore base operations and $12 million for boat operations at its Morgan City shore base alone. In addition, a slight upward fluctuation in oil prices had sparked exploration and production activity, increasing demand for the already scarce marine logistics assets. Boat lease costs had risen two to three hundred percent from 1993 to1996.

In the early 1990's, Aberdeen Service Co. Ltd., established third-party contract logistics services (CLS) for petroleum platform operators in the North Sea and demonstrated its potential economic benefit to the industry. CLS transfers responsibility for the provision of logistics support from the oil company to a logistics specialist. This permits the oil company to focus management energy and capital investment on core exploration and production business activities. The contractor manages the logistics resources, which are shared across its customer base, with a focus on reducing the total logistics costs of each participating oil company. CLS applications by Aberdeen Service Co. Ltd., yielded logistics cost reductions of approximately 30 percent equating to a 12 percent increase in profit margins for the participating oil firms. These benefits were derived from the release of working capital, economies of scale, better resource utilization and improved management position. While some of these benefits could be derived individually by any oil company, the balance of savings could not have been achieved without the drive to attain synergy and economies of scale with other oil companies. Given the constraints on competition, and anti-trust law which hampers resource sharing agreements among major oil companies, relying on a third party to provide logistics services is one way to unlock these potential benefits.

In early 1996, Coastal Logistics Inc., was formed as a joint venture to explore opportunities for establishing logistics services to support offshore petroleum exploration and production operations in the Gulf of Mexico. Both of CLI's parents had established records in the offshore petroleum industry, and viewed the Gulf of Mexico as a fertile area for applying the 'resource sharing' concept that was successfully implemented in the North Sea. CLI's long term vision was to become the 'UPS of the Gulf'. In order to attain this objective, CLI would attempt to establish shore base operations in all of the major ports in the Gulf of Mexico.

CLI started operations with a bare bones management staff consisting of a president, logistics and information systems director, systems analyst, and marketing director. Other personnel would be added as needed. The firm would draw upon its parents for software development and technical support during its startup years. The parent companies established a board of directors consisting of representatives of each parent firm to monitor CLI's progress. The board expected CLI to show a profit within three years. CLI immediately began promoting the 'Shared Resources' concept at industry trade shows and contacted platform operators. At the same time, they began the development of a geographic information system (GIS) based software program titled "Integrated Logistics Management System" (ILMS) for managing shore bases and marine vessels. ILMS would be a critical component for integrating both the information and physical flows associated with establishing coordinated logistic services.

AOC expressed early interest in the shared resource concept and met with CLI's management several times to explore its potential benefits and how it might be implemented. Where traditionally each oil company provided its own logistics services at low capacity utilization, CLI proposed that AOC turn over its shore bases and marine assets to CLI. In turn, CLI would use these assets to provide logistics services for AOC and other platform operators in the region. This would expand the customer base using the assets and lower the logistics costs. CLI and the platform operators would share the logistics savings associated with the increased efficiencies. In addition, the oil companies would be relieved from managing their own logistics activities, permitting them to focus on their core competencies in exploration and production. The proposal followed the general concepts implemented by Aberdeen Service Company Ltd. in the North Sea.

By mid 1996, AOC and CLI formed a research team to validate the economic feasibility of the resource sharing concepts. At their first meeting, the team decided to study the shore base operations in Morgan City, Louisiana as a test case. In addition to AOC, several other major and independent platform operators maintained shore bases there and had expressed an interest in the project. In particular, two independent operators, Petroleum Resources (PR) and Gulf Energy Inc.(GEI), had previously contacted CLI about the need to lower their logistics costs and encouraged CLI to establish third party operations in their production areas. Both firms pledged to participate in the task force's feasibility study.

BUSINESS SITUATION: LOGISTICS ACTIVITIES IN MORGAN CITY

Figure 1 shows the geographic area served by the Morgan City shore bases and the manned production platforms operated by AOC, PR and GEI. The platforms represent less than five percent of the total number of production platforms in the region. Each oil platform is identified with a geographic area prefix and a sequence number. In addition to production platforms, each firm operates several drilling platforms that are not identified in Figure 1.

Production platforms are either manned or unmanned. Manned platforms are staffed by a crew size ranging from 2 to 10 workers. The platform crew provides all the activities necessary to extract oil and gas from the ground and route it to onshore facilities for processing. These activities include controlling the production processes and maintaining capital intensive production equipment. Unmanned platforms are serviced from the nearest manned platform. Platform crews work a variety of shift schedules. A typical work shift is 7 days on and 7 days off working 12 hours per day. Crew changes are performed by helicopter or boat shuttle to and from the shore base.

Production platforms generate demand for a variety of products. These include potable water, fuel, lubricants, equipment, spare parts, and groceries, among others. Due to the limited storage space on the platform, weekly replenishments of many items are necessary. In addition, emergency shipments of spare parts are sometimes required. All production byproducts (e.g., used parts, trash and broken tools) are transported back to the shore base for disposal. Table 1 provides the boat cargo capacities needed to support the average weekly requirements of AOC's, PR's and GEI's production platforms. The data indicates the square feet of outbound boat deck space required for platform delivery, inbound deck space required for returning byproducts to the shore base, and the outbound bulk capacities required for the delivery of potable water and diesel fuel to the platforms. In the table, outbound refers to shipments originating at the shore base, and inbound refers to shipments originating at the platforms. Delivery requirements vary among platforms depending on the number of unmanned platforms supported, the crew size, equipment age, whether or not the platform is equipped with a water maker, and whether the platform is fueled by natural gas extracted during production or diesel fuel that must be delivered from shore.

The manned platform supervisor schedules and coordinates all production and maintenance activities for his platform group. He identifies demand requirements, places replenishment orders with onshore vendors, and schedules product deliveries with the onshore boat dispatcher.

Onshore facilities consist of boat docks, warehouses, boat loading and unloading equipment, and administrative offices. Shore base staff includes a supervisor, logistics coordinator, 2-3 dispatchers, several yard workers, and secretarial staff. The shore base dispatcher is the primary interface with the platforms. He receives land-based shipments destined for the platforms, stages them by destination platform in the shore base warehouse, and coordinates their shipment to the platform. AOC provides complete onshore logistics activities for their platforms. However, intermediate sized firms typically just maintain a shore base office and lease dock space, warehousing, and loading/unloading services from larger operators. The smaller operators often buy dock services as needed.

Two main categories of boats, crew boats and supply boats, provide logistics services to the platforms. Both boat types are equipped to handle a variety of cargo characteristics. Boats contain bulk storage tanks for hauling potable water, fuel, and drilling mud; open deck space for transporting drilling pipe, large equipment and tools; and enclosed cargo bins for shipping groceries, small parts and tools. Crew boats are smaller than supply boats with an average deck space of 1,450 square feet of cargo space. However, they are faster and burn less fuel per unit distance traveled. Crew boats are primarily used to support production platforms and run regularly scheduled routes. Each route typically serves from 1 to 6 platforms depending upon the volume demanded by each platform, their distance from the shore base, and the capacity of the delivery vessel. Emergency deliveries to platforms occur as needed. Supply boats average 3,300 square feet of cargo deck space. Due to their large capacity and relatively slow speed, they are primarily used to support drilling platforms. It takes approximately two dedicated supply boats and 1.25 crew boats to support a drilling platform.

Each platform is equipped with cranes for loading/unloading cargo. The boats have pumps for unloading liquid bulk products. Boats are capable of loading and unloading cargo 24 hours a day depending upon the crew's familiarity with the platform, weather conditions, and platform docking facilities. When possible, deliveries are scheduled to occur during daylight hours. Boat crews consist of a captain, first mate, and deck hands. Typical crew size is four to six men. Boat crews operate a variety of work shifts with routes lasting up to two weeks in duration. Typical routes last one to three days. Most oil companies acquire boats through long-term leases, which include boat maintenance and crew costs. However, for emergencies and one-time needs, boats can be leased by the day at the 'spot' rate. The spot rate is a function of boat availability and demand. The spot rate is typically twice the long-term lease daily rate. Due to a decline in ship building activity in the late 1980s and early 1990s boat supply in the late 1990s is tight. Current lead times to obtain a long-term boat lease average 24 months. Table 2 provides typical operating characteristics and lease rates for the 135 foot crew boats and 180 foot supply boats operating out of Morgan City shore bases.

A delivery route begins at the shore base when the boat is loaded. Bulk cargo such as potable water, fuel, and drilling mud are pumped into the boat's storage tanks at dedicated loading facilities. These bulk liquid items are stored in large compartmentalized tanks in the vessel's hull.

Other materials such as pipe, drilling bits, and production equipment are loaded onto the boat's deck at the shore base with cranes. Upon release by the dispatcher, the boat travels down the river to the inter-coastal sea buoy where it begins its delivery route. The sea buoy is approximately forty-two miles and 2.5 hours transit time from the Morgan City Pass shore base. The delivery route follows a specified sequence of platform deliveries. After making its last delivery, the boat returns to the sea buoy, and then goes back up river to the shore base, where it unloads the material returned from the platforms.

ANALYSIS: THE BENCHMARK STUDY

The first task of the research team was to document the current logistics procedures and costs of AOC, PR and GEI to provide a benchmark for comparison. The research team directed its efforts on the delivery system for the production platforms. The team identified two major cost categories: delivery route costs and shore base operating costs. It then devised a strategy to collect the relevant data from the firms. In order to gather boat costs and operating data, each boat captain filled in a daily Boat Log that documented the boat's activities over a 24-hour period. The boat logs were kept over a two-month period. The boat logs captured data on boat loading and unloading times, running time, standby time at platforms and shore bases, down time for repairs, and inclement weather standby times. Additionally, the logs tracked all diesel fuel and lubricant usage. This enabled fuel consumption while running, and consumption while on standby to be calculated. Using the boat logs, average utilization rates for the delivery boats were computed. The summarized data is presented in Table 3.

During August 1996, AOC, PR and GEI ran the regularly scheduled delivery routes identified in Table 4. Each route began and terminated at a Morgan City shore base. In assigning platforms to routes, the objective is to minimize the cost of the delivery routes, including boat lease costs and operating costs. To insure adequate deck space is available to pickup byproducts from the platforms, the outbound cargo is limited to 85% of the boat's deck space. In addition, the three firms attempt to assign their boats to 24 hour duration daily delivery routes with at least three hours per route scheduled for loading, unloading, and standby at the shore base. Table 4 provides the sequence of platforms served and the capacity utilization of the boats.

AOC held the long-term lease on Miss Ellie, a 135 foot crew boat, but subleased her to another platform operator three days per week. AOC ran three scheduled routes: AOC-1 on Wednesday, AOC-2 on Thursday, and AOC-3 on Saturday. In addition, about once a month Miss Ellie made a delivery to a jack-up barge in one of the oil fields. A jack-up barge is a shallow water structure that can be moved from platform to platform to temporarily expand the storage or work space at a permanent platform site. Delivery requirements for the jack-up barge averaged 200 square feet of deck space. The location of the jack-up barge varied over time. Its delivery was worked into a regularly scheduled delivery route.

PR and GEI shared Miss Janice, a 135-foot crew boat. PR controlled the long-term lease. Each firm used the boat 2 days per week to service their production platforms. In addition, PR used the boat to serve one of its drilling platforms 2 days per week. Each firm had an option to use the boat on Sundays when the need arose. The firm using the boat on Sunday paid that day's lease rate, otherwise the lease for Sunday was split with PR paying 70 percent of the lease cost and GEI paying 30 percent. On average each firm used the boat one Sunday per month.

Table 5 presents an analysis of the seven delivery routes listed in Table 4. The table indicates the boat used on each route, the number of platform deliveries, the total route distance, the boat running (in-transit) times, and times at the platforms and shore base. Boat lease and fuel costs associated with the routes are also provided. Assumptions for the calculations are: 1.5 hours for unloading, loading and standby at each platform served, a minimum of 3 hours is necessary for unloading, loading, and standby at the platform for each delivery route, $.75 per gallon fuel cost, and $2,100 per day boat lease cost. Note that in Table 5, boat lease costs are assigned according to the actual number of hours used on the route with a minimum charge of 24 hours. Miss Ellie's average running speed is 22 miles per hour with a fuel consumption rate of 100 gallons per hour while running and 50 gallons per hour while idling at a platform or at the shore base. Miss Janice's average running speed is 18 miles per hour with a fuel consumption rate of 110 gallons per hour while running and 50 gallons per hour while idling at a platform or at the shore base.

While the benchmark study did not consider emergency supply runs for the delivery of spare parts, or delivery requirements to support drilling platforms, the research team felt that any savings obtained from improving production platform supply would be matched from improved efficiencies in supporting the drilling operations.

A second area for potential cost savings was in shore base consolidation. Annual operating costs for AOC's shore base including wages, insurance, taxes, amortized facility and equipment costs, etc., were approximately $1 million per year. This included support for both production and drilling operations. The research team determined that 40% of the shore base overhead costs should be allocated to support logistics operations associated with production platforms. PR leased dock space and loading/unloading services from AOC for $6,000 per month, but maintained its own shore base office for an annual cost of $140,000. GEI's annual shore base operating costs for production platforms were $180,000. The annual cost of providing shore base services from a single consolidated operation was projected to be $620,000. The savings were attributed to the elimination of duplicated staff, facilities, and equipment.

CONSOLIDATION OF THE CURRENT SYSTEM AND IMPLEMENTATION

Joe reviewed the route information in Table 4 and Table 5 once again, and plotted the current boat routes on Figure 1. He knew there had to be a better way. He immediately set about redesigning the seven routes assuming that CLI was the sole service provider for the three firms. Once this was accomplished, he would analyze their performance and then compare them to the current routes. To aid him in his efforts he constructed a table showing the distances between the shore base and all platforms, and all inter-platform distances. These are given in Table 6. After he finished this part of the analysis, he would direct his attention toward developing an implementation plan. An important component of this plan would be the pricing strategy for each platform served. Funda Sila, logistics coordinator of PR, had already suggested that platform WD34 might be served more efficiently by adding it to route AOC-3, and she wanted to know what the delivery price would be assuming it was appended to route AOC-3. It was going to be a long night, but Joe was looking forward to that large bowl of gumbo at the Crawfish Cavern.

TABLE 1
TYPICAL WEEKLY DEMAND BY PLATFORM

Platform ID#	Outbound Deck Space	Inbound Deck Space	Potable Water	Diesel Fuel
EI105	328	244	820	0
EI126	163	50	0	0
EI128	616	450	974	0
EI240	236	190	1820	0
GC18	400	281	2600	0
GI20	153	114	0	0
GI76	59	37	1281	0
GI94	328	244	820	0
SM10	335	284	0	810
SM132	426	293	2200	284
SM205	163	150	2716	0
SM243	177	200	1845	0
SP10	426	293	2614	284
SS182	177	166	1845	960
SS219	16	0	974	0
SP72	335	260	1281	810
VR215	300	244	1200	750
VR271	410	250	900	920
WD34	29	24	256	0

TABLE 2

OPERATING CHARACTERISTICS OF TYPICAL CREW AND SUPPLY BOATS

Characteristics	Crew Boat	Supply Boat
Length	135 feet	180 feet
Open Deck Space	1,450 square feet	3,300 square feet
Diesel Fuel Capacity	10,800 gallons	43,700 gallons
Potable Water	15,000 gallons	15,000 gallons
Running Fuel Consumption	100 gallons per hour	160 gallons per hour
Standby Fuel Consumption	50 gallons per hour	50 gallons per hour
Average Running Speed	18 miles per hour	10 miles per hour
Fuel Cost	\$.75 per gallon	\$.75 per gallon
Long Term Boat Lease	\$2,100 per day	\$7,250 per day
Spot Rate Boat Lease	\$4,200 per day	\$14,500 per day

TABLE 3

AVERAGE UTILIZATION OF BOAT

Activity	Production Routes	Drilling Routes
Standby at shore base	40%	18%
Loading/Unloading at shore base	2%	14%
Running time	37%	23%
Loading/Unloading at platform	13%	17%
Standby at platform	8%	28%
Standby for maintenance/weather	0%	0%

TABLE 4
BOAT UTILIZATION ON CURRENT DELIVERY ROUTES

Route Name	Delivery Route	Out Bound Deck Space	In Bound Deck Space	Water	Fuel
AOC-1	SB-EI240-SM205-GC18-SB	55%	43%	61%	0%
AOC-2	SB-SP10-SP72-SB	59%	40%	49%	3%
AOC-3	SB-SS182-GI94-GI20-SB	45%	36%	25%	6%
PR-1	SB-SM10-SM132-SB	53%	40%	20%	6%
PR-2	SB-SS219-GI76-SB	6%	3%	21%	0%
GEI-1	SB-EI105-EI128-WD34-SB	75%	55%	19%	0%
GEI-2	SB-SM243-VR215-VR271-EI126-SB	81%	57%	37%	11%

TABLE 5
ANALYSIS OF CURRENT DELIVERY ROUTES

Route Name	Boat Name	Number of Platforms	Route Miles	Route Duration (hours)	Platform Standby (hours)	Shorebase Standby (hours)	Boat Lease	Intransit Fuel Cost	Platform Standby Fuel Cost	Shorebase Standby Fuel Cost	Total Route Cost
AOC-1	ELLIE	3	319	14.5	4.5	5.0	$2,100	$1,088	$169	$188	$3,544
AOC-2	ELLIE	2	213	9.7	3.0	11.3	$2,100	$726	$113	$424	$3,363
AOC-3	ELLIE	3	345	15.7	4.5	3.8	$2,100	$1,176	$169	$143	$3,588
PR-1	JANICE	2	226	12.6	3.0	8.4	$2,100	$1,036	$113	$317	$3,565
PR-2	JANICE	2	306	17.0	3.0	4.0	$2,100	$1,403	$113	$150	$3,765
GEI-1	JANICE	3	333	18.5	4.5	3.0	$2,275	$1,526	$169	$113	$4,083
GEI-2	JANICE	4	284	15.8	6.0	3.0	$2,168	$1,302	$225	$113	$3,807

TABLE 6

SHORE BASE AND INTER-PLATFORM DISTANCES

From/To	EI105	EI126	EI128	EI240	GC18	GI20	GI76	GI94	SM10	SM132	SM205	SM243	SP10	SP72	SS182	SS219	VR215	VR271	WD34
EI105	0																		
EI126	6	0																	
EI128	6	3	0																
EI240	39	42	45	0															
GC18	84	87	90	60	0														
GI20	102	108	111	119	116	0													
GI76	95	107	110	105	88	28	0												
GI94	91	92	95	98	74	46	20	0											
SM10	35	38	35	35	95	133	123	123	0										
SM132	70	74	77	35	74	154	133	126	53	0									
SM205	79	76	79	47	56	146	128	119	72	25	0								
SM243	42	38	41	56	116	137	133	133	25	70	94	0							
SP10	49	54	54	67	77	56	46	49	81	98	109	91	0						
SP72	36	42	49	67	81	53	45	53	81	102	105	88	14	0					
SS182	39	42	42	39	49	81	63	60	67	70	74	77	35	38	0				
SS-219	46	49	49	35	39	91	70	63	67	67	91	81	42	45	11	0			
VR215	60	63	66	46	98	158	147	140	28	32	60	46	105	108	84	81	0		
VR271	81	84	87	56	98	175	158	151	52	25	49	70	119	122	95	88	25	0	
WD34	109	112	115	130	123	11	35	52	144	165	165	144	63	66	91	98	168	186	0
Shorebase	56	59	62	84	132	147	140	149	69	104	132	70	95	104	92	96	102	91	156

FIGURE 1
PROSPECTIVE PLATFORM LOCATIONS