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Management's cargo handling problems in the domestic shipping industry

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Thesis

MANAGEMENT'S CARGO HANDLING PROBLEMS
IN THE DOMESTIC SHIPPING INDUSTRY

by

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INTRODUCTION

The United States Domestic Shipping Industry is composed of interstate and intrastate carriers of cargo via water. This thesis will discuss only sea-going common carriers of dry cargo, operating vessels of more than one thousand gross tons, in this trade. The restriction was deemed necessary to cover fully the segment of the industry which has experienced the greatest difficulty in its operations.

A common carrier by water, as defined in Part III of the Interstate Commerce Act, is any carrier which holds itself out to the general public to engage in transportation by water for compensation; except such transportation by express companies which are regulated under Part I of the Act.

The industry is divided into two parts, each having distinctly different characteristics but being enough alike in operation to permit a discussion of their problems jointly. The coastwise trade is considered to be the movement of cargo by water between two or more points on the Atlantic and/or Gulf of Mexico ports or Pacific Coast ports. The intercoastal trade embraces those movements of cargo via water between Atlantic and Gulf of Mexico ports and Pacific Coast ports moving via the Panama Canal.

PROBLEM

The problem facing management, in the domestic shipping industry, is that of a declining volume of business and
curtailment of its operations forced by the reduced volume of cargo. The reduced volume has been caused by many factors: such as, competition from other modes of transportation, cessation of operations during World War II, and increased cost of operations in the industry.

The cost of cargo handling in the industry has increased to a point where it now constitutes two-thirds of total revenue received by some companies. As the cost of cargo handling absorbs the greatest part of income, it is the area in which management, by employing sound policies, can increase profits by reducing expenses. Management has more control over the operation in this area than in others which are subject to government regulation; such as, rates, certificates, and manning scales of vessels. Cargo handling is the process by which the cargo is moved from the terminal aboard, stowed in the ship, and unloaded from the ship to the terminal at port of destination. It also includes the receipt and delivery of cargo to and from the terminal. The problems facing management in the cargo handling area include; organization of the companies, sales or traffic soliciting, terminal facilities and personnel, control of the cargo handling operation, research methods improvement, industrial relations and finance.

The purpose of this study will be to investigate the problems faced by management in the area of cargo hand-
The domestic shipping industry was chosen because of the seriousness of this problem. The relationship of the individual company's management to the problem of cargo handling will be discussed.

Although cargo handling cost is an important factor in all shipping; its impact on certain domestic trade, because of relatively short hauls and because of competition with land transportation systems, is particularly severe.*

This is an explanation of why cargo handling costs are more important in domestic shipping than in foreign shipping.

The vessels operating in foreign trade can use foreign longshoremen in foreign ports, the price of foreign labor is much less than United States labor. The distance of movement is greater in foreign trade which provides a larger basis over which to spread the cost of cargo handling. The domestic operator calls at closely spaced ports with very little time spent at sea.

SIGNIFICANCE

The domestic dry cargo industry, prior to World War II, was composed of 378 vessels, totaling 2,039,000 gross tons. In 1949, there were only 127 vessels of 1,046,000 gross tons employed in this trade.# The signifi-

* 35, p.17.
# These figures were compiled from information given in reference 34, pp. 14-15-16.
cance of the large drop in the number of vessels and total tonnage to the United States is that historically, domestic shipping has comprised a large share of the total United States Merchant Marine. Because of its coastwise availability to home waters, it is the first component of the industry to be called upon to meet emergencies or wartime requirements.

In its present position, the industry is not providing the transportation service so vitally needed by the communities along the seaboard of the United States. Many coastal and inland areas have received their economic prosperity in the past because of the fact that their products could move to market via economical domestic water transportation.

Many consuming areas have been supplied with building materials, raw materials and food stuffs at low cost which have only been possible through the use of domestic water transportation. The United States needs a modern and efficient domestic shipping industry for continued economic prosperity and national defense.

The shipper of cargo is concerned with the disappearance of the common carrier in this trade, as most shippers do not ship sufficient volume to operate their own vessels or to contract for the use of vessels. If the common

* 34, p.17.
carrier does not operate, then the shipper is confronted with employing more expensive land carriers. Many industries in the past have depended on the less expensive domestic water carrier to enable them to reach distant markets on a competitive basis.

The industry has experienced declining profits. This is caused, in part, by the high cost of cargo handling. Reduced volume of business has forced many operators to leave the industry. Prior to World War II, twelve companies operated in the Atlantic coastwise trade, but presently only three are engaged in this trade. Some of these companies are still operating in the foreign trade while others, like Eastern Steamship Lines, have been forced entirely from the shipping industry. Such drastic changes in any industry are not made without great pressure on the companies' management.

It cannot be said that all the problems of management with regard to cargo handling apply with equal force to each company. All problems apply in some degree to each company. The variance in degree of application is due to the different routes over which they operate, variation in commodities carried, and special operating methods and techniques used by some companies.

Management's number one job, if domestic operations are to be successful in the future, is economy in operation.
The reduction in handling costs can come through the application of suitable mechanized systems for moving cargo into and out of ships, through the modernization and improvement of port and terminal facilities and through the development of ships of specialized types where their utility for the service in view is indicated.*

The cargo handling problems of management are similar to the problems that industrial and manufacturing management have with materials handling. In planning any materials handling operations, the objectives are the same for both; that is, to determine how to transport materials in the shortest possible time with the least expenditure of money and energy so as to obtain the maximum productive efficiency.**

Cargo handling is marine terminal materials handling. The difference between this and materials handling in a manufacturing plant is not in principle but in application. Both are a means to an end, each being necessary in order to complete a far more important and remunerative goal. Marine terminal materials handling involves the handling of a very diversified number of commodities; both in size, weight and shape, which change from voyage to voyage and port to port. The manufacturer handles a more or less constant volume and type of materials that do not change from day to day.

*35, p.18.
**3, p.3.
WORK DONE BY OTHERS

The American Merchant Marine has been the subject of much investigation by various agencies of the government. These studies, for the most part, have been about the United States shipping engaged in the foreign trade and primarily of an economic nature. The domestic trade was recently studied by the Maritime Commission. This study was primarily on the industry's specific problems, but cargo handling was treated in a general way. No effort was made to be specific about management's cargo handling problems.

The only study made with management problems in view was made by the House Committee on Merchant Marine and Fisheries. This study is applicable, in part, to the domestic trade but covers labor relations of the entire maritime field. The study places primary emphasis on a discussion of subsidized operators and whether or not they are easier to bargain collectively with, due to their being subsidized for part of their labor costs.

The only area of management's cargo handling problems which has received much study or research is the technical aspect of cargo handling. No attempt has been made to outline the areas where the industry's management, by using the principles of scientific management, can improve cargo handling.
There is a lack of sufficient information concerning management’s problems dealing with cargo handling. In this thesis, an attempt will be made to define, analyze and give suggestions for the solutions to these problems. It is hoped that this additional information will be helpful to the industry's management in helping them to find a solution to their cargo handling problems.

METHODS OF APPROACH

Only those problems of management which deal specifically with cargo handling will be considered. A background on cargo handling will provide the reader with the general information necessary to understand and analyze the remainder of the thesis. The importance of cargo handling in the domestic shipping industry is also presented in this chapter.

Next, a chapter on the companies' management will be included. This is divided into two parts, one dealing with top level management and the other with local management which is directly concerned with cargo handling. This chapter, in particular, will discuss the importance of cargo handling to the companies' management within the industry.

Management’s cargo handling problems are divided into two chapters: one deals with the overall problems of cargo handling, the other with the labor relations problems
of management relative to cargo handling. This division is necessary for a clear understanding and full coverage of the two distinctly different problems. The two areas are interrelated to the extent that they overlap where methods improvement and mechanization of cargo handling involve labor. Labor refers to the longshoremen engaged in handling cargo.

The next two chapters are on management's attempt to improve cargo handling methods, facilities and productivity. The first chapter covers the attempt of management to improve the conventional break-bulk method of operation. This is an attempt to make improvements on the traditional and, by some standards, obsolete method of cargo handling. The next chapter deals with management's attempt to utilize new methods of cargo handling which are revolutionary. They are a drastic change from the traditional break-bulk method. These new methods present many operational problems for management to solve.

The evaluation will be an attempt to evaluate the problems of management discussed in the previous four chapters. Also, to make suggestions for improvement of the present methods and greater utilization of the newer concept of cargo handling. In the conclusion, the entire thesis will be summarized and the future of the industry presented. Management's future cargo handling problems will be considered.
I. THE BACKGROUND OF CARGO HANDLING MANAGEMENT

A. The Evolution of Cargo Handling

Cargo handling dates back to the days of the Roman Empire when commerce on the Mediterranean was flourishing. The earliest method of handling cargo was entirely by hand. The cargo was carried from the pier aboard the vessel by man-power. This was accomplished by a chain gang method. Only small amounts of cargo were loaded in the vessel and the operation was economical as man-power was not, at that time, an expensive factor of production.

As the cargo carrying capacity of vessels increased, a faster and more efficient method was sought. A horse was substituted for the men to transfer the cargo from the pier to the vessel. The horse pulled a rope which was fair-leaded through a block on the vessel's mast. A hook was attached to the end of the rope. The cargo to be loaded was placed in slings or nets on the pier and the hook was attached to it. The horse pulled the cargo aboard the vessel by sliding it up a skid onto the vessel. The horse was then backed up and the cargo was lowered into the hold. This method was practicable only for such cargos as would stand the strain. No future developments were made in cargo handling methods until the invention of the steam engine, which replaced the horse.
The development of the steam engine changed not only the methods of cargo handling but also the vessels themselves. At first, the steam engines were located on the pier and the cargo handling operation was controlled from there. Later, 'donkey boilers' were placed on the sailing ships and steam winches were installed to permit more efficient handling of cargo. This installation made the vessel more flexible, as it was no longer dependent on the pier for power. The steam winches enabled larger amounts to be loaded at one time. The shipbuilding industry made great advances and ships were built larger and larger. With the building of steam powered ships, constructed of steel, two booms and two winches were placed at each cargo hold. The outboard boom was spotted over the pier, which enabled the cargo to be lifted from the pier without coming in contact with the ship. The inboard winch and boom then took control of the load and drew it inboard over the hatch and lowered it into the hold. The cargo was unhooked in the hold and the operation repeated.

For the most part, no improvement has been made in the handling of general cargos. The same basic method as described above is still used in the domestic shipping industry. This method of handling cargo is very ancient and inefficient. A new method of handling general cargo has recently been devised which will be discussed later.
A marked advance has taken place in the industrial community of the United States during the last one hundred years. Many technological changes have been instituted which have greatly improved the productivity of American industry and labor. The cargo handling methods employed by the majority of the domestic shipping industry has not been subject to any basic technological improvements. The age of industrial progress in the United States has by-passed cargo handling for many years and only recently has progress reached it. At the present time, certain changes are taking place which hold the promise of bringing at least part of the industry up to date. The acceptance of this new and revolutionary concept of cargo handling will depend to a great extent on management's decisions and actions in this area.

B. Improvement of Cargo Handling Equipment

The cargo handling equipment discussed here is the auxiliary equipment used to handle cargo. Many changes have taken place in this area, in contrast to the area previously discussed. The equipment consists of the machinery and tools used to facilitate the movement of cargo. The advances made in this area have never been fully realized as management has been unable to fully utilize the entire productive capacity of this equipment.

Until the advent of the small motor truck and later development of the gasoline and electric-powered fork lift
trucks, all handling of materials was done by manual labor. The manual handling of cargo was facilitated by the use of hand trucks and carts which are still used in some places today. There was no change in the auxiliary equipment until the early 1900's. From then on, advances were made not only in equipment but also in physical method of handling cargo.

Methods have been improved to the extent that such equipment as pallets, skids and containers are utilized to handle cargo. These methods improvements have taken place mainly on the pier with very little improvement to methods used for stowage of the cargo in the vessel's hold. Management has tried to make improvements in the past and will continue to do so in the future. The full acceptance of any method is dependent upon the method itself, the introduction of it by management, and the acceptance of it by labor.

Not all management within the industry has readily accepted new and improved methods in the past. The complacency within the industry has caused some improvements to be delayed so long before being placed in use that their period of usefulness has passed. Some of this resistance by management has been overcome only to be taken up by resistance of labor to new methods. The prospects for the future appear to be brighter as the resistance by labor is being gradually overcome in some areas.
C. The Cargo Handling Operation

As previously defined, cargo handling is the means by which cargo is transferred from the pier to the vessel. The movement of cargo from the vessel to the pier is also cargo handling. The operation starts when the company's freight solicitor, or salesman, calls on a prospective shipper to sell him space on a vessel for his shipment of cargo. The salesman offers the shipper the services of his company, and, if successful, he will obtain a shipment of cargo for his company. The salesman will obtain a list of the contents of the shipment, which he will give to the booking section of his department. This list will contain the necessary information to book cargo space for the shipment.

After the cargo has been booked, a stowage plan of the vessel will be made up. This plan will show all cargo on board and where the additional shipment is to be stowed. By keeping a current stowage plane, the sales force knows exactly the amount of space available for other cargo. The pier plan is made out from the stowage plan of the vessel. This plan shows where the cargo is to be placed before transfer to the vessel. This plan provides a smooth and uninterrupted flow of cargo to and from the vessel.

As the time for the vessel's arrival draws near, the booking section will send orders to the shippers which set the
time for the cargo to be delivered to the pier or terminal.
When the cargo arrives on the pier, it is unloaded and placed in its proper spot, as shown by the pier stowage plan. A checker will check the number of packages making up the shipment and inspect it for damage.

When the vessel arrives in port, practically all shipments of cargo that are to be loaded will be on the pier. The vessel will unload any cargo destined for this port and it will be stowed on the pier in its predetermined place. After the discharging operation has been completed, the loading will commence. The cargo is moved from its position in the terminal to the pier apron. It is then lifted aboard the vessel and stowed in the hold according to the stowage plan.

After the inbound cargo has been unloaded and placed on the pier, the parties for whom the cargo is intended are notified of its arrival. They are requested to make arrangements to have it picked up.

This sequence of events comprises cargo handling and will be repeated at each port of call of the vessel. The importance of this operation cannot be over-emphasized. A section will be included to show the importance and seriousness of this operation to the industry.
D. The Men Involved in Cargo Handling

There are two groups of employees involved in the actual handling of the cargo. They consist of longshoremen and personnel employed on the pier or in the marine terminal. In some ports, longshoremen are employed to do both jobs while in others there are two separate work forces. Even if longshoremen are employed, a distinction can be made as they perform different types of work.

Longshoremen work in what is commonly called a gang. The number of men in a gang varies from port to port. In a twenty-two man gang, the job titles of the men would be as follows:

Table I

The Job Title and Number of Men Comprising a Longshore Gang

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Number of Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hatch Foreman</td>
<td>1</td>
</tr>
<tr>
<td>Assistant Hatch Foreman</td>
<td>1</td>
</tr>
<tr>
<td>Signal Man</td>
<td>1</td>
</tr>
<tr>
<td>Wench Operator</td>
<td>2</td>
</tr>
<tr>
<td>Hold Crew</td>
<td>8</td>
</tr>
<tr>
<td>Slingers</td>
<td>2</td>
</tr>
<tr>
<td>Wharfmen</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22</strong></td>
</tr>
</tbody>
</table>

A gang consists of three groups arranged according to the work they perform. One group is on the deck of the vessel. This group is made up of the hatch foreman, assistant hatch foreman, signal man, and the winch operator. The hatch foreman is the boss of the gang and moves about the deck near the hatch supervising the cargo handling operation of the entire gang. The gang boss is responsible to the boss stevedore for the hatch his gang is working. The assistant hatch foreman generally assists the hatch foreman and will be found on the pier or in the vessel's hold whenever the operation slows down. The signal man gives signals to the winch operators to hoist or lower the cargo. The winch operators are unable to see into the vessel's hold or onto the pier, so they depend on the signal man for orders to move the cargo.

The second group is the hold crew which consists of eight men divided into two groups. Four men work on each side of the vessel. These men are responsible for stowing the cargo in its proper place and in the prescribed manner. They unhook the cargo from the hook and hook on the empty cargo net to return to the pier where it can be loaded again. Then, they take each package and carry it to where it is to be stowed. The package is placed in its spot in a tier. The hold men also lay dunnage to even out the tier and form a platform on which to stow cargo, or build a bulkhead between different types of cargo. They also will place filler in the tier to strengthen and fill out a row. This filler is necessary as
the majority of packages are of a rectangular shape and the hold has many curves and interruptions in it. This work is important for, if it is not done properly, the cargo may be damaged. Also, if not stowed properly, it could shift and cause damage to the vessel.

The third group consists of the longshoremen employed as slingers or wharfmen. The number of men actually working on the pier will vary from operation to operation. This is due to the nature of the cargo being handled. If it is on pallets, then the wharfmen will have no work to perform and will, in most cases, work with the hold gang. If the cargo has not been made up into sling loads prior to loading, then the wharfmen will make up the drafts for transfer to the holds. One or more of the wharfmen will operate a fork lift truck which will carry the cargo from the terminal to the pier. The slingers will hook and unhook the cargo nets or slings from the cargo hook.

The other employees at a marine terminal include: truckers, checkers and clerks. The trucker's job is to move the cargo inside the terminal. They will help unload the trucks and freight cars in some cases. After unloading, the cargo must be moved to the proper place in the terminal for storage. When cargo is to be picked up at the terminal, the truckers will move the cargo from its storage place to the truck dock, where the truck driver will load it. It is some-
times necessary for the truckers to shift the storage place of cargo because of a change in plans or to facilitate the future loading operation.

The checkers perform two different functions. One is to check the cargo when it is picked up or received at the terminal. The other function is to check the cargo when it is loaded or discharged from the vessel. The checking of cargo is very important as it is from these tallies that the shipping documents are made. Also, if the checker over counts the cargo, then the company would be liable for the amount of overage which it signed for. When the cargo is delivered to the pier, the checker counts the number of packages which comprises the shipment and, at the same time, notes any of the packages which are damaged. When the cargo is being loaded onto the vessel, the head checker will tally the number of packages in each sling load or draft. An assistant checker is in the hold of the ship. His duty is to tally the cargo which is stowed by the hold gang and to set aside any damaged cargo and notes it. The damaged cargo will be coopered, if possible, at this time. The assistant also watches the longshoremen to insure that there is not any pilferage of cargo from the vessel. When cargo is discharged from the vessel or picked up at the pier, the checker will count the number of packages delivered to insure that the proper number are delivered.
The duties of the clerks in the terminal are to make out shipping documents and to sign for cargo which has been received at the terminal. The clerk uses the count taken by the checker to make out the dock receipt for the cargo. On the dock receipt, he will note any damaged cargo noted by the checker. The clerk also issues delivery orders, which permit truck drivers to receive the cargo, after seeing the bill of laden. The company has to insure that only the proper person is given the cargo, as the rightful owner will have a claim against them if they do not.

Nearly all of the men employed in the cargo handling operation are union members. The longshoremen and checkers belong to the International Longshoremen's Association on the Atlantic and to the International Longshoremen's and Warehousemen's Association on the Pacific Coast. Both of these unions are very strong and hold almost absolute power over the entire cargo handling operation. These unions provide all of the longshoremen used on the Atlantic and Pacific coasts, both for foreign and domestic trade.

The personnel employed on the pier can belong to the longshoremen's union or to the warehousemen's union. These workers will invariably belong to one or the other. The high degree of union membership in this industry is due to the closed shop agreement the unions have with the terminal's management. It is practically impossible for a non-
union worker to secure employment as a longshoreman, checker or trucker in a terminal. Having the highest degree of union security possible for a long period of time has not resulted in any great change in the attitude of organized labor toward management. The maturing of union leadership has taken place in many industries when labor has been given maximum union security. This change has not taken place in the domestic shipping industry.

E. Equipment Used to Handle Cargo

The cargo handling equipment used in the terminal consists mainly of motorized and manually operated trucks, trailers and carts. The most used and versatile piece of machinery is the fork lift truck. These trucks are operated by either gasoline or electricity, depending on the make. The advantage of the electric-powered truck is that it can be operated in dangerous areas where safety codes will not allow a gas powered truck to operate. There is danger from the heat and fumes of the exhaust of the gasoline powered fork lift truck. Its great value lies in the fact that once the cargo is palletized, it can be moved from place to place without manual handling of the cargo again. The fork lift truck is also able to tier palletized cargo. This allows cargo to be tiered on top of itself, which saves valuable storage space. The versatility of this piece of equipment is greatly increased when attachments such as: chisel-
edge forks, detachable rams, detachable scoops and fork plates, are used on it.

Small tractors and trailers are used to move cargo into the terminal and out on the pier apron. These trailers can be loaded by a fork lift truck and towed by the tractors. Carts are used for the same purpose as trailers and are pushed by hand. Small two-wheeled hand trucks are also used to move small quantities of cargo about the terminal.

Ship's tackle is used to transfer the cargo to or from the pier. This tackle consists of two booms, each having a winch. The capacity of this tackle on most vessels is rated to handle five tons of cargo. On some vessels operating in the intercoastal trade, each hatch has two sets of tackle. This permits the use of two longshore gangs at one time. Each gang works at a different level in the hold. They do not interfere with each other and can greatly speed up the cargo handling operation.

F. Marine Terminal Facilities

A marine terminal consists of a pier on which a transit shed is located. The cargo is stored in this shed. There are railroad tracks on the pier, which allows freight cars to reach the sheds where they are to be unloaded. The transit shed has a truck dock where trucks can load and discharge cargo. By having the shed on the pier, the cargo does not have to be transferred from a warehouse to the pier prior
to loading. The nature of the cargo carried by the operators requires covered storage, with the exception of the lumber carried eastbound from the Pacific Coast.

The companies do not own all of the terminals they use. There are three types of ownership of marine terminals. The operator may own and operate its own terminal. This is the case in the home ports of most of the operators. In other ports, where the volume of business is not sufficient to carry the expense of terminal operations; they use a terminal operated by either public or private interests. Public interests consist of the various port authorities; such as the Boston Port Authority and the New York Port Authority. Private interests are companies who operate terminals for the use of others; such as the Boston Tidewater Terminals, Inc., who operate the Army Base Terminal in Boston. The cost of using a terminal is determined by the ownership of the terminal. If the operator owns his own terminal, the entire cost of the operation is borne by him, unless he allows other operators to use his terminal facilities. The Luckenbach Steamship Company leases the Castle Island Terminal in the port of Boston. This terminal is owned by the Port of Boston Authority and leased to Luckenbach for a fixed sum per year. The facilities of this terminal consist of a concrete wharf 4,200 feet long, providing berthing space for seven vessels. There are two one-story transit sheds which provide a gross covered storage area of 302,400 square feet.

*7, p.13.
The Luckenbach Company uses one of the terminal sheds for its own operation and allows other operators to use the remaining facilities. The charge for using this pier is 12.5% for each ton of cargo loaded or discharged, with a minimum charge of $50.00 per day. This charge is called a dockage charge and is collected by the Luckenbach Company. The total cost of the terminal is not borne by this company as the revenue received from others is used to defray operating expenses.

Chart I is the outline of a well laid out and modern marine terminal. As can be seen, adequate space is provided for the movement of cargo to and from the apron. Also, easy access for freight cars and motor trucks is provided, which greatly facilitates the receipt and delivery of cargo at the terminal.
II. THE ORGANIZATION OF COMPANIES

A. Top Level Management Organization

1. General Organization Structure

The organization of companies will be discussed on two different levels. The first section will cover the organization of the companies' executives at the home office. The next section will cover the organization of the companies at the local level. This is the level at which cargo handling management takes place, except for the broad policies set by executives in the home office. The diversification of management is due to the large geographical area over which the companies operate. Some of the companies have operations on all three coasts of the United States, which necessitates a decentralized organization.

The organization to be presented is not of any one company, but instead is a composite of all companies' organizations engaged in the domestic shipping industry. The basic source of the organization to be discussed is that of the American President Lines Limited. This company operates both in the domestic and foreign trade; therefore, the part of the organization applicable to the foreign trade has intentionally been omitted. It is believed that the organization presented would be applicable to any company operating exclusively in the domestic trade, with some changes due to special operations and individual personalities within the different companies.
All companies operating in this trade are corporations. Four of the companies are subsidiaries of larger corporations. Two of these companies operate in the inter-coastal trade and carry lumber, produced by their parent corporation, eastbound. Another company carries the steel products, produced by its parent corporation, in the domestic trade. The remaining company is the subsidiary of a large steamship company.

2. Executive Officers

As in all corporations, the board of directors is elected by the stockholders of the corporation who, in turn, select the president of the company. The president is responsible for the over-all success of the company's operation. He is responsible for the successful co-ordination of a large number of diversified functions which take on particular importance in the domestic shipping industry. Two of his functions particular to this industry are to meet with regulatory officers and legislative bodies to discuss regulation of commerce in the industry. The president may be aided by an executive vice-president, but such assistance is not common in the industry. As can be seen from the organization chart, there are eight department heads and two or three division managers reporting directly to the president. The number of division managers will depend on the extent of decentralized organization the company operates under.
The department heads have line responsibility to the president and line authority over the personnel in their departments in the home office. They have staff responsibility to the other departments and functional control over the departmental responsibilities at the local level. The division managers have line responsibility to the president for all company operations within the geographical area assigned to him. He has line authority over all company personnel employed with this area. The exact amount of authority delegated to the department heads and division managers will vary from company to company, depending on its operations and the individual personalities and capabilities of the executives.

3. The Freight Traffic Department

The freight traffic department is the sales department of the company. The duties of the department include: establishing cargo rates, solicitation of cargo, booking of cargo, cooperating with the operating department to establish sailing schedules, and making out the cargo documents. The head of this department will be a vice-president of the company. The department is subdivided into three divisions to facilitate the performance of its duties. These divisions are: sales, traffic and traffic administration. They have functional control over all company policy in these areas.
Chart II. TOP LEVEL MANAGEMENT ORGANIZATION

Board of Directors

President

Freight Traffic Division
Sales Division

Traffic Division
Traffic Administration

Operating Division
Marine Division

Finance Division
Port Engineers Division

Assistant Treasurer
Port Steward Division

Accounting Division
Cargo Handling Division

Insurance Division
Port Terminal Division

Assistant

Service and

Supply

Claims Department

Public Relations Department

General Department

Research Department

Supply Department

They co-ordinate the activities of all the local traffic departments throughout the company.

The sales division is responsible for sales programs of the company and establishes sales quotas for each company office and agency. The head of this division issues instructions on the companies’ sales policy and program. He instructs the local offices in the assignment of individual salesmen’s quotas. Also, he plans and administers the company’s sales training program to be administered by the local office to its salesmen. A continuing survey is conducted by this department of shipments and destination of cargo to furnish the information required to develop fully the sales to all existing and potential accounts.

The traffic division is, to a great degree, responsible for the scheduling of the company’s vessels. The operation department has actual control over the vessels, but the vessels follow the cargo which is solicited by the sales department. This division studies commodity movement in order to, by the proper scheduling of vessels and rate policy, insures that the company is able to obtain as large a percentage of the business provided by the movement of these commodities. This division co-ordinates all cargo moved by the company to insure the maximum utilization of the company’s vessels. This division is divided into three sections to perform its diversified functions. The rate section keeps a record of all rates on cargo carried by the company and its competitors.
This section issues the tariffs which contain the rates charged for the movement of cargo. The company will only issue its own tariff if it does not belong to a rate conference or if they take exception to the conference rate on certain cargo. The remaining two sections are organized to achieve efficient traffic administration in the two main areas of operation. In the intercoastal trade, these areas would be eastbound and westbound traffic. In the coastwise trade, they would be northbound and southbound traffic. This section reviews the schedules of vessels and the amount of cargo to be shipped and recommends management action when changes are indicated.

4. The Operating Department

This department is responsible for the operation of the company's vessels, administration of all sea going personnel, maintenance of the vessels, supervision of new vessel construction, furnishing stores and supplies to the vessels, and operating the company's marine terminals. The vice-president of operations, who is the department's head, will have an administrative assistant to aid him by issuing all salary schedules and supervising the office personnel. The department is divided into four main divisions: they are, the marine division, the engineering division, the cargo handling and terminal division, and port stewards division.
The marine division, headed by the marine superintendent, is in charge of all vessels and all personnel employed on them. He appoints all deck department officers and approves the officers employed in the other departments of the vessel. His other duties include: preparation of sailing orders to the vessel's master, reviewing the vessel's logs, and preparing inspection reports after inspecting the vessel's state of preservation.

The engineering division is responsible for the operation, maintenance and inspection and repair of the vessel's machinery. The repair superintendent engineer screens requisitions of engine department stores against the vessel's allowance list, recommends all engine room personnel and examines engine room logs. He co-ordinates all new vessel construction and conversion and maintenance of all existing vessels.

The cargo handling and terminal division is under the direction of the superintendent of cargo operations. His duties are to select, contract with and evaluate the stevedores employed by the company. He also maintains records of cargo handling, improves terminal layout, and develops and initiates new methods of cargo handling. The duties of this important division will be discussed in greater detail in Section B of this chapter.
The port stewards division is charged with responsibility for determining the company's policy towards the meals and services for the crew. Many of the duties of this department are part of the collective bargaining agreement under which the crew is employed. The chief port steward is in charge of this division. Its importance should not be overlooked as a well fed crew is, in most cases, a happy one.

5. Finance Department

The company's treasurer is the head of the financial department. This department is responsible for the following functions: establishing systems for internal audit, maintaining cost records, maintaining the company's insurance program, administering the budget, and maintaining property records. The department is divided into three major divisions.

The assistant treasurer has as his primary responsibility the administration of company funds and securities. His duties are: to receive and disperse cash, marshaling of funds, contacts with banks, temporary investment of idle cash, and the safeguarding of cash and securities.

The accounting division is responsible for maintaining all general and subsidiary ledgers, regular reports to management, tax returns and to prepare all special financial reports to guide management action. The head of the division is the chief accountant.
The insurance division is responsible for maintaining the company's insurance program. There are many types of insurance which the company must carry in order to protect itself against tremendous losses, such as the sinking of a vessel. Also, the company carries protection and indemnity insurance and cargo damage insurance.

6. Other Departments

The claims department closely resembles a refund department in a department store. Adjustments are made to the shippers if cargo is lost or damaged. This department adjusts all claims made by shippers or consignees of cargo against the company for any lost or damaged cargo. The bill of laden is a contract between the shipper and steamship company for the movement of cargo. It sets forth the company's responsibilities in the event that the cargo is lost or damaged while in its possession. The fast and courteous settlement of claims is a prerequisite of good customer relations so important in any industry. The chief claims agent has his office in the company's home office and approves all claims settlements. District claims offices are maintained on a geographical basis. The heads of these offices have limited authority to settle claims. Other duties of this department include salvaging damaged cargo and taking action to reduce damage to cargo by analysing claims that have been filed against the company.
The public relations department is responsible for the company's advertising program. It gives out public relations information and prepares speeches for executives. The duties of this department in the various companies operating in the industry differ. More and more companies, having realized the great importance of labor relations, have included it as a function of this department. The companies bargain collectively with the longshoremen's unions through an association of shipowners and stevedoring companies. In the past, the responsibility for labor relations has been undertaken by these associations, but the results have not been favorable. The steamship companies are now organizing their own labor relations staff to perform this vital function. As the department's duties have been increased to include labor relations, the administering of the company's advertising program has been shifted to the traffic department.

The service and supply department performs the centralized purchasing of stores and supplies for the company. It performs all functions of procurement of stores and is charged with their custody. The department issues supplies and stores to the vessels after they have been requisitioned and checked against the vessel's allowance list. These lists are a method of controlling the waste or overstocking of stores and spare parts.
The general department is a staff department which renders services to all departments in the home office of the company. These services may include: employment of office personnel, compensation of office employees and their working conditions. Also, they provide services and benefits to employees and bargain collectively with them, if so required. The department is, in a sense, a personnel department; but its duties are restricted to include only the employees engaged in work in the company's home office.

The research department, headed by the director of research, is responsible for making investigations that are submitted to it and approved by the company's president. This department is continually growing in size and importance in most companies. Formerly, most of the studies were of a market research nature, but now its field has been increased to include research into all phases of company operation.

E. The Organization of Cargo Handling Management

1. Background

The organization of management at a port where the companies maintain offices to handle the entire company operations is to be discussed in this section. In the previous section, top level management at the home office was presented. It is at the local level that direct contact with cargo handling takes place. As noted earlier, the division manager within whose jurisdiction the port is located, has line
authority and responsibility over the local operation. Chart III, on the following page, shows the organization of management at a port.

As can be seen from the chart, all primary functions provided for in the home office are represented in the local office. The extent of the authority existing at the local level will depend on the degree of decentralization of control within the company. The decentralization of control is present in most companies and is becoming more prevalent within the industry. This has been due to the fact that the inland area, from which cargo is generated, has been reduced to a point where most cargo is secured within a fifty mile radius of the port. It is no longer necessary for the company to maintain offices in a great number of cities to solicit cargo for the port. This has increased the stature of the port office and it has been given more control of the operation in the port.

The port organization shown is not that of any one company but, instead, is intended to be an organization which would be applicable to any company operation in the domestic trade. This port organization is, in fact, submitted as a model organization which some companies might well adopt as their own. Their present port organization is very weak and very little control is maintained over it by the home office.
Chart III. ORGANIZATION OF LOCAL MANAGEMENT

Division Manager

- District Claims Agent
  - Port A
  - Port B
  - Port C

Freight Division Manager

- Freight Sales
  - Salesmen
  - East Bound
  - West Bound
  - Unit
  - Clerks

- Documentation

- Booking

- Section

- Clerks

Marine Superintendent

- Port Captain
  - Port Engineer
  - Port Steward
  - Pier Superintendant

Office Manager

- Personal
  - Mail
  - Cashier
  - Accounting
  - Payroll

- Records

- Clerks

- Clerks

- Clerks

- Clerks

- Clerks

- Clerks

2. Local Freight Traffic Department*

This department is responsible to the division manager for selling cargo space, preparation of all shipping documents, and booking the cargo. The manager has three assistants, one in charge of each function. The manager receives instructions from the central traffic department regarding sales program policies and rates and is responsible to it for the functions with which he is charged.

The sales force, consisting of the salesmen and their section head, sells the cargo space to the shippers. The selling of cargo space is selling a service and not a commodity. The principle on which a service is sold is substantially the same as when a commodity is sold. This principle is price, speed of service, quality of service, and to maintain good supplier relations. The field of freight salesmen has shown great improvement since the selling is no longer done on a strict personal basis between the shipper and the salesmen. Each salesman is given a sales quota by the division manager which he is to fill from his assigned accounts and any new accounts which he is able to establish within his territory. The only record kept by the section heads is the individual record maintained by the salesman. The performance records are maintained in the booking section. These records are made available to the section heads and division manager.

*1, p.228.
The booking section is composed of the section head and a number of clerks who receive the sales reports from the salesmen. This section knows the amount of cargo space allotted on each vessel which comes into the port. When the shipping order is received from the salesmen, the booker subtracts the amount of space to be allotted to this shipment from the total space available. This section will inform the salesmen of the amount of space available on the ship so that the ship will not be over-booked and cargo left on the pier. The section will record the sales credit to the proper salesman and to the customer’s account.

The documentation section receives the shipping order from the booking section and makes up the proper shipping documents to be executed prior to the vessel’s sailing. These documents include: the dock receipt, bill of laden, and ship’s manifest. This section must apply the correct charge to the shipment. To do this, it must convert the volume and weight of each package into the appropriate rate unit.

3. The Local Operations Department

a. The Marine Superintendent

The marine superintendent of the port is responsible to the division manager for the function of the port’s operating department. He has four assistants to aid him.*

*5, p. 82.
in performance of this function: the port captain, the terminal superintendent, the port steward, and the port engineer. These assistants are responsible to the marine superintendent for the performance of the duties assigned to each of their respective sections. In some ports, the duties of the marine superintendent might be assigned to the port captain or the terminal superintendent, who then would have dual responsibilities; those of the marine superintendent's position and the duties of the section he is charged with.

The port captain, port engineer and port steward have the same duties and responsibilities as those of their counterpart discussed under top line management, except that the scope of the duties is restricted to the local port. The only exception is the port captain, whose responsibility in the local port includes making up the stowage plan of the vessel from information received from the booking section of the local traffic department. In order to make out the stowage plan, he must have an understanding of the different types of cargo handled in the port, and the design of the vessel's cargo hold, if he is to place the cargo on board so that the maximum amount of cargo is loaded.*

* 5, p.80.
b. The Local Terminal Organization

In discussing the local terminal, it is assumed that the company either owns or leases on a long term basis the terminal it uses. The terminal superintendent is responsible for the entire operation which occurs at the terminal. He must also co-operate closely with the local traffic department, for there are many problems that necessitate the combined decision of the two departments. These decisions center around the problem of what types and quantities of cargo the salesmen should attempt to secure to provide the company with maximum revenue and minimum expense for the voyage of each vessel.

The pier superintendent has four or five assistants, depending on whether or not the company does its own stevedoring. The assistants are: the chief clerk, the chief checker, the head guard, the timekeeper, and the boss stevedore. If the company uses a contract stevedore; then it is the duty of the pier superintendent to co-operate with, supervise and evaluate the performance of the stevedore. The work of the stevedore is far too important to be left entirely in the hands of an independent agency whose liability is limited and not necessarily interested in the company’s profit.**

If the company does its own stevedoring, then the boss steve-

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*5, pp. 33-89.
**5, p. 81.
Chief is directly responsible for the loading, discharge and stowage of the cargo aboard the vessel. He will be assisted by a hatch foreman, who will work for the company on a permanent basis. They are responsible to the boss stevedore for the work in their section of the vessel. The hatch foremen are responsible for the stowage of the cargo in its prescribed place, as shown on the stowage plan, and in the correct manner as prescribed by tradition.

The chief clerk is responsible for the receipt and delivery of cargo at the terminal and for its stowage in the proper place. Working under his supervision, a receiving clerk takes charge of all cargo received at the terminal and a delivery clerk takes charge of all deliveries made from the pier. These clerks sign the dock receipts for the cargo and the cargo release after signing the proper documents. The chief clerk will make up a terminal stowage plan, for the use of his clerk in assigning space to cargo in the terminal, from the vessel's stowage plan. The chief clerk, in some terminals, will have authority to employ or has a permanent number of men employed to move cargo from place to place in the terminal.

The chief checker is charged with the responsibility of counting all cargo delivered and received at the terminal. He will have under him a sufficient number of checkers to perform this function. After the cargo has been tallied and checked for damage, the tally sheets are turned over
to the receiving or delivery clerk. These tallies are used to make out the dock receipts and release orders. By tallying the cargo in and out of the terminal, it is possible to spot pilferage of cargo and helps to pin-point in what part of the operation it is taking place.

The head guard is employed to provide protection to the terminal itself and to the cargo stowed within it. In most cases, four guards are employed to maintain a twenty-four hour vigilance in the terminal. The guards in some terminals have the authority to search any person entering or leaving the terminal. This helps to reduce pilferage of cargo.

The timekeeper is employed to keep all time that each longshoreman works for the company in order to properly make out the company's payroll. As the number of men employed changes from day to day and also the men themselves, this is a difficult job.

4. The Local Office Manager

The office manager is responsible for providing the services necessary for the smooth functioning of all activities at the port. These services include: maintaining personnel records of office employees, the necessary accounting and financial records, pay-roll records, and the numerous records which must be kept of the company's operations. The
office manager will be in charge of the bookers, record clerks, filing clerks, billing clerks and typists; who are responsible for maintaining the various records. An important function of this office is to bill all shippers properly and promptly. The bill is made out from the bill of lading, which provides all necessary information for billing the customer.

5. The District Claims Agent

All claims received by the local office are sent directly to the district claims agent. The agent will investigate the claim and make recommendations for its settlement to the company's claims office. When a final decision has been made, the local office will be notified of its disposition so it will be able to complete its records. Also, the salesman of the account which filed the claim will be notified so he may inform the customer of the disposition of his claim.
III. MANAGEMENT'S CARGO HANDLING PROBLEMS

A. Definition

The problems which management in the domestic shipping industry is faced with, in the area of cargo handling, is how to handle the cargo at the lowest possible cost. This broad statement of the problem should not be taken as the only management problem in the area. The broad problem is sub-divided into many smaller problems.

The effect and repercussions of the cargo handling problem of management will be discussed in three main areas. These areas are: sales, production, and finance. The area of production is loosely named as the industry produces no finished product, it only creates a utility for the product. The production function of the companies within the industry is managed by the different companies' operations department. The areas of sales and finance in this industry conform to the general definitions of these areas in other industries.

B. Importance of Cargo Handling

One of the best ways to show the importance of cargo handling is to show the relationship between total cost and cargo handling cost. The cost of cargo handling has risen steadily since 1933, when it amounted to approximately 33% of the total operating expenses of the companies.* The cost of

* Table II, p.55.
cargo handling at the present amounts to from 50% to 70% of total operating expenses. At the present time, it costs the company more to load and discharge the cargo than it does for the vessel to transport the cargo from port to port.

Table II

COMPARISON OF TOTAL STEVEDORING COST WITH TOTAL REVENUE IN THE INTERCOASTAL TRADE

1939 to 1950

(In Dollars Per Ton)

<table>
<thead>
<tr>
<th>Year</th>
<th>Stevedoring Cost</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1939</td>
<td>3.317</td>
<td>10.75</td>
</tr>
<tr>
<td>1940</td>
<td>3.511</td>
<td>NA#</td>
</tr>
<tr>
<td>1941</td>
<td>3.930</td>
<td>NA</td>
</tr>
<tr>
<td>1942-1946 (Government operated ships in this trade)</td>
<td>8.061</td>
<td>15.57</td>
</tr>
<tr>
<td>1947</td>
<td>7.745</td>
<td>18.05</td>
</tr>
<tr>
<td>1948</td>
<td>8.633</td>
<td>19.71</td>
</tr>
<tr>
<td>1950</td>
<td>9.720</td>
<td>20.55</td>
</tr>
</tbody>
</table>

# Not Available

Table II shows that the average cost of stevedoring has increased from when it constituted only one-third of the average revenue per ton of cargo carried. The average cost of stevedoring has increased 2×1.39% (1939=100), while the average increase in revenue has been only 92% (1939=100). These figures are for 1950. An estimate made by the San Francisco Bay Port Authority in 1953 placed the
average cost of cargo handling at $16.00 per ton of cargo. The difference between the two figures is that the figure for 1950 includes only stevedoring cost; whereas, the 1953 estimate is for total cargo handling cost. The difference is that the stevedoring cost is part of the total cargo handling cost which includes such other costs as: terminal cost, checking cost, and clerk cost.

The coastwise trade has higher cargo handling costs than the intercoastal trade. Their cost runs as high as 70% of total revenue. The reason for this higher cost is that the cargo rates are lower for moving the cargo over shorter distances than in the intercoastal trade. The only difference between the problems encountered by management in the two trades is that, in the coastwise trade, the repercussions have been slightly more severe.

The domestic trade was reviewed after World War II when the United States government operated all vessels. The situation which resulted after the war was not caused by cargo handling problems alone; but the major difficulty was the effect of high cargo handling expenses borne by the operators.

Of six carriers entering the Atlantic Gulf trade, three retired in less than six months after incurring heavy losses. The remaining three weathered the trade only by extensive service adaptation and technological improvement.
The intercoastal trade has never had more than 60% of the World War II ship's cargo capacity. With the April, 1952 discontinuance of the American Hawaiian Lines service, it now is roughly 50% of the 1939 tonnage. Along the Pacific Coast, only one common carrier operates three vessels of 30,000 tons; as compared with eleven prewar common carriers operating twenty vessels of 112,985 tons.*

C. Sales

1. Reduced Volume of Cargo Handling

The domestic shipping industry has experienced a reduction in sales volume, in terms of the number of tons of cargo which the operators have carried. The individual company's sales force has been unable to provide the company with increased tonnage of cargo. This reduction has occurred during a time of high industrial activity in the United States. The reduction in number of tons carried has not greatly affected the companies' total income as rates for carrying the cargo have been increased, as shown in Table II. Table III shows the revenue the companies received for carrying cargo. The table points out the severe loss within the different coastwise companies; but it should be noted that the dollar value of sales for the individual companies still operating in the trade has remained fairly constant. In the intercoastal trade, the individual companies which are still operating have managed to increase their dollar sales value.

## Table III

### Yearly Revenue of Selected Operators in the Domestic Shipping Industry

**Coastwise Operators**

<table>
<thead>
<tr>
<th>Year</th>
<th>Pan Atlantic Steamship</th>
<th>Seatrain Lines</th>
<th>Newtex Steamship</th>
<th>Coastwise Lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>1956</td>
<td>9,004,766</td>
<td>11,698,379</td>
<td>1,176,228</td>
<td>7,256,753</td>
</tr>
<tr>
<td>1955</td>
<td>7,591,791</td>
<td>12,749,335</td>
<td>1,333,787</td>
<td>2,259,445</td>
</tr>
<tr>
<td>1954</td>
<td>8,968,247</td>
<td>12,188,428</td>
<td>1,307,777</td>
<td>3,016,861</td>
</tr>
<tr>
<td>1953</td>
<td>11,703,485</td>
<td>12,214,455</td>
<td>2,333,430</td>
<td>3,063,771</td>
</tr>
<tr>
<td>1952</td>
<td>6,209,391</td>
<td>11,802,474</td>
<td>3,176,333</td>
<td>3,154,983</td>
</tr>
<tr>
<td>1951</td>
<td>10,266,845</td>
<td>8,632,476</td>
<td>3,498,103</td>
<td>3,154,983</td>
</tr>
<tr>
<td>1950</td>
<td>14,560,927</td>
<td>8,042,186</td>
<td>3,689,097</td>
<td>3,084,536</td>
</tr>
<tr>
<td>1949</td>
<td>11,917,150</td>
<td>6,408,691</td>
<td>2,868,960</td>
<td>2,397,071</td>
</tr>
<tr>
<td>1948</td>
<td>5,215,629</td>
<td>5,549,833</td>
<td>5,963,117</td>
<td>700,390</td>
</tr>
</tbody>
</table>

**Intercostal Operators**

<table>
<thead>
<tr>
<th>Year</th>
<th>Weyerhaeuser Steamship</th>
<th>Calmar Line</th>
<th>Luckenbach Steamship</th>
<th>Pope &amp; Talbot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1956</td>
<td>11,973,905</td>
<td>19,689,448</td>
<td>36,511,081</td>
<td>11,633,281</td>
</tr>
<tr>
<td>1955</td>
<td>12,016,172</td>
<td>17,635,087</td>
<td>34,564,916</td>
<td>9,575,902</td>
</tr>
<tr>
<td>1954</td>
<td>11,239,128</td>
<td>14,084,135</td>
<td>31,813,354</td>
<td>10,309,673</td>
</tr>
<tr>
<td>1953</td>
<td>10,689,201</td>
<td>14,482,087</td>
<td>33,789,177</td>
<td>10,408,026</td>
</tr>
<tr>
<td>1952</td>
<td>7,956,433</td>
<td>12,900,236</td>
<td>25,046,045</td>
<td>8,761,261</td>
</tr>
<tr>
<td>1951</td>
<td>8,010,569</td>
<td>12,615,714</td>
<td>19,537,073</td>
<td>8,387,155</td>
</tr>
<tr>
<td>1950</td>
<td>6,961,374</td>
<td>11,075,566</td>
<td>17,979,742</td>
<td>8,501,089</td>
</tr>
<tr>
<td>1949</td>
<td>6,439,688</td>
<td>10,074,987</td>
<td>14,965,036</td>
<td>6,226,765</td>
</tr>
<tr>
<td>1948</td>
<td>1,671,717</td>
<td>7,956,845</td>
<td>7,712,994</td>
<td>4,176,105</td>
</tr>
</tbody>
</table>

2. The Cost of Cargo Handling

The reduced volume of sales has not been caused entirely by the cargo handling problem of management, but much of it is the result of the high cost of cargo handling. As cargo handling costs have risen, the company has had to raise its prices to stay in business. As the cost of this service to the shipper has increased, the companies have lost their inherent advantage. This advantage was that the cost of their service was from 10% to 20% lower than other competing services. This 10% to 20% difference enticed the shipper to use this service, even though it is somewhat slower. With the increase in price, the companies have decreased the differential to where it now is, nonexistent in some cases and not enough in others to provide the sales force with an effective selling point.

3. Loss and Damage of Cargo

The loss and damage of cargo while it is being handled has been responsible for some of the reduction in sales volume. The shippers who, in the past, used the domestic shipping industry's services have found that the amount of their cargo that is lost or damaged has increased during the past few years. Prior to World War II, the operation in the intercoastal trade experienced loss and damage claims.

*50, p. 352.
amounted to 10¢ per ton of cargo. Now, the claims amount to $1.00 per ton of cargo.*

The shipper, when he uses the domestic service, cannot be sure that his cargo will reach its destination without being lost or damaged. The loss or damage of a customer's cargo is a serious matter as customer relationship is so important in selling. The settlement of any loss or damage claim takes a certain amount of time. Also, if the customer does not accept the settlement, the matter will have to be taken to court. If a customer is not completely satisfied with the settlement, he may in the future use a competing company or another type of service, which results in a loss of business to the company.

4. Speed of Cargo Handling

The time that it takes the operator to deliver a customer's shipment is dependent on cargo handling. The longer it takes to handle the cargo, the longer the vessel will be delayed in port before it can start on its voyage. Also, the time the vessel spends unloading the cargo will increase the total time it takes for the shipment to reach its destination. The production of longshoremen has not increased and their overtime rate is so high that it prohibits the company from working overtime to handle cargo.

*13, p. 21.
This means that it takes the company longer to handle its cargo.

The customer is interested in the time it takes for the cargo to reach its destination. If this time is so long that he can't complete his sale, he will have to use another type of service. Also, the price differential offered by the shipping company may not be enough to offset the slower transit time for the shipment. In either case, the company will lose business.

5. Inherent Problem

These problems are related to the nature of the business. The sales force has not only the responsibility of securing cargo for the company, but it must find the right kind of cargo. The kind of cargo that the company carries is the type on which it will make the most profit. A cargo is profitable only when the cargo handling qualities of it are ideal. The cargo must not take excessive time to handle or the cost of handling will be excessive. As in the case of penalty cargo, the companies must pay the longshoremen a premium rate. The sales force has to take into consideration the cargo handling qualities of the cargo, prior to attempting to sell the shipper space for the cargo.

*36, p.48.
D. Production

1. Vessel Operations
   a. Speed of Cargo Handling

   This area is divided into two parts. The first part deals with the utilization of the vessel as it is affected by cargo handling. The problem of cargo handling, which affects the vessel will be covered. The second area is that of terminal and stevedoring operations, which is the other part of the production process in the industry. It is in this area that management has direct control over cargo handling and where the solution to all of its cargo handling problems lie.

   The vessel is in port for as long as it takes to load and discharge cargo. The time taken to handle cargo will determine the length of time the vessel will remain in port. It costs approximately $2,000 per day to keep a vessel in port.* The cost of the vessel is not added to the cargo handling cost. If this cost were included, the total cost for cargo handling could run from 60% to 80% of the total operation cost.**

   The cost of operating a vessel is fixed, for the most part, except for fuel oil which varies directly with the

*32, p.56.
**32, p.56.
distance the vessel travels. Therefore, it would cost the company only a small additional amount if the vessel were at sea continually. The cost of operating the vessel would not increase appreciably if the number of days it spends at sea were increased. One way management can increase the number of voyages the vessel makes per year is to cut down the port time of the vessel. In order to reduce the time spent in port, the cargo handling process must be speeded up.

By speeding up the cargo handling process, the company could reduce the number of vessels that it would have to operate. The reduced number of vessels could meet the same sailing schedule and carry as much cargo. This would mean that the same revenue would be earned with less vessel operating expense. The over-all profitableness of the company would be increased if the cost per ton of cargo handling did not increase.

b. Damage to Vessel

The cargo handling process may cause damage to the vessel. This is most apt to occur when heavy lifts are loaded or discharged. Heavy lifts in this industry would consist of machinery, steel products, and unitized loads of lumber. The damage caused by these heavy lifts occur when the vessel's tackle is overloaded or when the load is not controlled properly.*

*2, p.176.
The lift may exceed the safe working load of the tackle, which will cause it to break and drop the load. The safety of the longshoremen is also endangered when this occurs. Their safety will be discussed further in Chapter IV. If the load is not controlled properly and is allowed to swing, it may hit structural parts of the vessel or other cargo and cause damage.

The damage caused by poor cargo handling will be reflected in the company's operating expenses. The expenses will be for repair and replacement of the vessel's tackle and for damaged cargo. Also, the unemployment and insurance rates of the company would increase.

c. Vessel's Safety

The stability of the vessel is determined by the manner in which the cargo is stowed aboard it. The stability of a vessel is its ability to float and to return to an upright position after it has listed by wave action. When the cargo is not stowed properly, the vessel may list and cause the cargo to shift, which may capsize the vessel. When cargo is stowed on deck improperly, it may come loose and endanger not only the vessel but also the crew. The safety of the crew is affected by cargo handling as the method of securing the cargo on deck creates safety hazards. The crew is in danger when walking on the deck, as this clutter presents

*§* p. 206.
accident hazards. The improper stowage of cargo which endangers the vessel could cause the company's insurance and workman's compensation rates to increase. Also, it might result in civil or criminal court proceedings against the company by members of the vessel's crew.

2. Terminal and Stevedoring Operations

a. Problems in this Area

It is in this area that the main cargo handling problems exist. These problems affect other areas of the business as already shown. It is in this area that management can solve its cargo handling problems. The rules for maintaining maximum speed and minimum cost in cargo handling are as follows:

Prompt and proper assembly of cargo
Adoption of efficient methods of moving cargo to the pick up place
Adoption of efficient methods of separating and stowage of discharged cargo
Use of all hatches when loading or discharging the vessel
Providing adequate lighting services for offshore delivery
Adoption of efficient methods of stowing cargo in vessel's holds

*5, p.32.
Increasing the productivity of labor
Standardization of equipment best suited for transferring the cargo from the terminal to the vessel
Harmonizing the design of the vessel with the requirements of the cargo handled.

The problems management has with cargo handling are created when they try to follow these rules. The rules are not distinct, as one will affect another. An increase in the production of labor will result from the adaptation of efficient methods of stowing the cargo in the vessel's hold. Therefore, the problems encountered by management when trying to follow one rule will influence the problems met when trying to adapt another rule to the cargo handling operation.

b. Explanation of the Problems

The rules for cargo handling did not include all aspects of the cargo handling problems of management. These others are: loss and damage of cargo due to cargo handling, the use of stevedoring companies, and safety of personnel employed in handling cargo. These three problems are affected when any attempts are made to make improvements in or to obtain maximum efficiency in cargo handling as prescribed by the rules. Management must take into consideration the affect that the changing of one rule will have on all the other rules.
The assemblage of cargo at the terminal is important as it is the first step in the cargo handling operation and, if not performed correctly, will hinder further operation. In order to insure prompt and proper assemblage of the cargo, management must plan for the receipt of cargo at the terminal prior to its arrival there. To plan this operation in advance, management must prepare a schedule which will show the time which each shipment of cargo is to arrive at the pier. Also, the schedule should allow for the cargo that is to be loaded first to arrive at the terminal first. Problems encountered here are; that the shipment may be delayed, that a shipment may be canceled at the last minute, that a shipment may be sent without prior notice, or it may be shipped at the last minute.

The three fundamental points in assemblage of cargo at the terminal are: (1) each shipment should be placed in the terminal opposite the place where the vessel's hold, into which it will be loaded, will be when the vessel docks, (2) cargo that is to be loaded first should be placed as near as possible to the side of the terminal next to the vessel (3) the cargo should be placed so that it is readily accessible and not buried beneath other cargo which is to be loaded after the buried cargo. To follow these points, man-
Management must know the characteristics of the vessel and have the vessel's stowage plan made up in advance of the vessel's reaching port. Also, careful planning of the space next to each hold is necessary so all cargo to be loaded into the hold is in its proper place.

Unless the assemblage of cargo is planned adequately, the entire cargo handling operation may be hindered. If the assemblage of cargo is improperly planned or organized, the productivity of labor will be lower, cargo will be subject to loss and damage, and the safety of the employees will be impaired. This will occur because cargo will have to be re-handled and re-stowed prior to its being loaded.

The cargo must be moved from its temporary storage place in the terminal to the pier apron from where it will be hoisted aboard the vessel. This is accomplished by mechanical equipment provided by the terminal. The same equipment is used to accomplish this as is used to move the cargo from the receiving platform to its temporary storage place in the terminal.

Management must plan the flow of cargo from the storage place to the pick-up point, as shown by the vessel's stowage plan. The flow of cargo must be smooth and without interruptions. This cannot be accomplished if the cargo is not assembled in the terminal properly. An unplanned opera-
tion will find cargo moving across the normal flow of cargo, which will cause interruptions. The flow of cargo should be direct and cover the shortest distance possible.

The cargo handling equipment at the terminal must be the most efficient that management can provide. The equipment should be capable of stacking the cargo in order to save space in the terminal, handling the largest unit of cargo practicable, give safe operation without endangering the workers, and be maintained in a good state of repair. If the flow of cargo and the utilization of the efficient equipment are not planned and organized by management, the same factors as noted under assemblage of cargo will be adversely affected.

Prior to commencing the loading operation, the cargo destined for the port must first be discharged. The cargo must be separated before it can be placed in storage in the terminal to insure that the many different shipments being discharged from the vessel are kept together and stowed in the same place. Management must plan this phase of the operation so that a space is provided in the terminal for each shipment. This can be accomplished prior to a vessel's arrival in port as a stowage plan of the vessel, showing the location of each shipment of cargo destined for the port, is sent to the terminal superintendent. The same type of equip-

\*4, p.50.
ment will be utilized to move the cargo from the delivery point to the storage place as is used in other phases of the cargo handling operation. Also, the same factors will be influenced as noted in the earlier phases of the operation if management does not properly plan and organize this operation.

The location of the cargo stowed aboard the vessel will determine if all hatches can be used to discharge the vessel. Management, when planning for the stowage of cargo aboard the vessel, should provide an equal amount of cargo to be loaded into each hatch. The amount of cargo should be equal only in the time it will take to load that amount of cargo into each hatch. The importance of this is that the amount of port time of the vessel can be reduced if all hatches are used to load the vessel. Instead of taking twenty hours to load the cargo into one hatch, if five hatches are used, the loading operation can be accomplished in approximately four hours. Also, by proper planning and organization of the stowage plan, the vessel will not be detained while the loading of one hatch is completed. As previously explained, the utilization of the vessel depends on the time spent handling cargo.

The remaining areas of management's problem will be discussed in other chapters of the thesis. Productivity of labor is discussed in Chapter IV and improvement of pro-
ductivity of labor is found in Chapters V and VI. The remaining areas are discussed in various appropriate places throughout the thesis.

c. Use of Stevedoring Companies

Some shipowners state that they use stevedoring companies because their cost of cargo handling is reduced when they do. They say that the stevedoring companies are specialists in the art of cargo handling, which the company is not. Also, the stevedoring companies are able to provide steady employment to the longshoremen, thereby keeping the same work force and being able to train them to efficiently handle cargo. The stevedoring companies maintain a large inventory of cargo handling equipment with which to perform the operation.

These advantages enable the shipowner to operate without a heavy capital investment in cargo handling equipment. Also, he is able to hire a work force that is supposedly highly specialized in the efficient handling of cargo. The cost of maintaining a large cargo handling management group at the port is also eliminated. The greatest advantage to the shipowner, in using a contracting stevedoring company, is that the cargo handling is accomplished at a pre-determined rate. This means that the shipowner knows what his cargo handling cost will be in advance. He is able

*1, p.169.
to plan and allow for the cost of cargo handling when establishing rates.

There is much doubt as to the real advantage of using stevedoring companies in the industry. This is true when the company has a sufficient volume of business to support the operation of its own terminal. Most companies that have a sufficient volume of business do their own stevedoring, either by the company itself or through wholly owned subsidiaries, thereby becoming their own stevedores. There are many companies that still use stevedoring companies, even when these conditions exist. Also, in ports where only a limited amount of volume is obtained, practically all of the companies utilize the service of the stevedoring companies.*

Given as the primary disadvantage of using stevedoring companies is the lack of control that management has over this important phase of cargo handling. The lack of control is not only over the stevedoring companies but also over the individual longshoremen. With cargo handling becoming more important, due to rising cost, the tendency is towards the companies performing their own stevedoring.

Some management has made improvements on the methods of cargo handling to be used in their operation only to be opposed by stevedoring companies. This is due to the ste-

*1, p.233.
Vedores attempt to standardize their operations, which from their viewpoint is advantageous. The individual companies do not necessarily prefer to use the standardized methods in their operations. This is due to the different nature of the cargo carried by them, which may make specialized methods of cargo handling advantageous.

The lack of control over the longshoremen by management has allowed many practices to develop which curtails efficient cargo handling. If management had taken strict control of these employees some time ago, many of these practices might have been avoided. Also, the area of labor relations has been effected by this lack of control as the shipowners and longshoremen have not come into direct contact. No attempt will be made to formulate a generalized conclusion on the use of stevedoring as the individual companies will have to determine which is most advantageous to it in any particular case.
E. Finance

1. The Cost of Cargo Handling's Effect on Profits

The cost of cargo handling has increased to the point where it constitutes 50% of the company's revenue. With cargo handling amounting to such a large percentage of expenses, it has a direct relationship to profits, if not a controlling affect on them. The cost of handling, in some cases, is in excess of the revenue received by the company for transporting it.*

Table IV is the comparable financial data of four coastwise operators. As can be seen, the companies are not in a much better financial position in 1953 than they were in 1948. The notable exception to this is sea-train lines. The reason for this will be discussed later.

Table V shows comparable data for four intercoastal operators. These operators engage only in the intercoastal trade. Therefore, the conditions portrayed are presumed to be representative of the entire industry. The over-all financial picture of the trade cannot be presented as some of the operators engage in the foreign trade. Some of their profits, if any, could be derived from this foreign trade and, therefore, not be representative of the intercoastal trade.

Cargo which is lost or damaged in cargo handling has an important relationship to profits. While no exact figures *

*p.123
### Table IV

**COMPARATIVE FINANCIAL DATA OF COASTWISE OPERATORS IN THE DOMESTIC SHIPPING INDUSTRY - 1948 and 1953**

<table>
<thead>
<tr>
<th></th>
<th>Pan Atlantic 1948</th>
<th>Pan Atlantic 1953</th>
<th>Seastrain Line 1948</th>
<th>Seastrain Line 1953</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Freight Revenue</td>
<td>11,913,112</td>
<td>11,730,485</td>
<td>5,438,331</td>
<td>11,509,375</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>12,932,613</td>
<td>12,668,910</td>
<td>9,701,075</td>
<td>11,803,517</td>
</tr>
<tr>
<td>Operating Expense</td>
<td>12,764,176</td>
<td>12,047,943</td>
<td>5,515,672</td>
<td>9,280,933</td>
</tr>
<tr>
<td>Net Profit (After Taxes)</td>
<td>157,954</td>
<td>1,590,535</td>
<td>2,555,672</td>
<td>1,176,636</td>
</tr>
<tr>
<td>Total Assets</td>
<td>7,399,446</td>
<td>7,442,994</td>
<td>12,318,850</td>
<td>22,468,447</td>
</tr>
<tr>
<td>Current Assets</td>
<td>4,320,727</td>
<td>4,019,114</td>
<td>7,164,276</td>
<td>7,768,221</td>
</tr>
<tr>
<td>Current Liabilities</td>
<td>703,530</td>
<td>1,465,379</td>
<td>2,686,612</td>
<td>2,739,675</td>
</tr>
<tr>
<td>Capital and Surplus</td>
<td>4,124,392</td>
<td>4,584,715</td>
<td>5,773,969</td>
<td>14,324,970</td>
</tr>
<tr>
<td>Number of Vessels</td>
<td>8</td>
<td>8</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Cargo Dead Weight Capacity</td>
<td>58,879</td>
<td>42,449</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Tons Traffic</td>
<td>261,761</td>
<td>734,261</td>
<td>490,573</td>
<td>NA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Newtex 1948</th>
<th>Newtex 1953</th>
<th>Coastwise Line 1948</th>
<th>Coastwise Line 1953</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Freight Revenue</td>
<td>4,828,135</td>
<td>2,332,441</td>
<td>832,475</td>
<td>3,177,408</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>4,883,777</td>
<td>2,337,241</td>
<td>8,003,091</td>
<td>9,018,953</td>
</tr>
<tr>
<td>Operating Expense</td>
<td>5,341,567</td>
<td>2,340,150</td>
<td>7,892,717</td>
<td>9,359,314</td>
</tr>
<tr>
<td>Net Profit (After Taxes)</td>
<td>473,507</td>
<td>2,191</td>
<td>131,076</td>
<td>4,200,044</td>
</tr>
<tr>
<td>Total Assets</td>
<td>711,582</td>
<td>593,392</td>
<td>2,149,027</td>
<td>3,335,633</td>
</tr>
<tr>
<td>Current Assets</td>
<td>646,480</td>
<td>216,161</td>
<td>1,339,202</td>
<td>1,794,581</td>
</tr>
<tr>
<td>Current Liabilities</td>
<td>1,972,797</td>
<td>44,578</td>
<td>94,358</td>
<td>1,569,237</td>
</tr>
<tr>
<td>Capital and Surplus</td>
<td>1,794,373</td>
<td>148,236</td>
<td>59,811</td>
<td>809,283</td>
</tr>
<tr>
<td>Tons Traffic</td>
<td>273,603</td>
<td>148,383</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Number of Vessels</td>
<td>NA</td>
<td>NA</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Cargo Dead Weight Capacity</td>
<td>NA</td>
<td>NA</td>
<td>43,080</td>
<td>21,000</td>
</tr>
</tbody>
</table>

NA — Not Available
D — Deficit

### Table V

**Comparative Financial Data of Interoastal Operators in the Domestic Shipping Industry - 1948 and 1953**

<table>
<thead>
<tr>
<th>Operator</th>
<th>1948</th>
<th>1953</th>
<th>1948</th>
<th>1953</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Freight Revenue</td>
<td>1,670,807</td>
<td>10,689,021</td>
<td>7,956,845</td>
<td>14,432,037</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>2,309,326</td>
<td>10,900,939</td>
<td>8,378,889</td>
<td>14,487,887</td>
</tr>
<tr>
<td>Operating Expense</td>
<td>2,530,673</td>
<td>10,799,574</td>
<td>7,272,723</td>
<td>11,601,287</td>
</tr>
<tr>
<td>Net Profit (After Taxes)</td>
<td>233,297</td>
<td>3,141</td>
<td>524,661</td>
<td>1,215,683</td>
</tr>
<tr>
<td>Total Assets</td>
<td>87,822,496</td>
<td>4,054,416</td>
<td>15,628,231</td>
<td>24,750,726</td>
</tr>
<tr>
<td>Current Assets</td>
<td>24,557,730</td>
<td>1,713,787</td>
<td>5,973,503</td>
<td>17,550,300</td>
</tr>
<tr>
<td>Current Liabilities</td>
<td>20,044,452</td>
<td>846,932</td>
<td>2,763,339</td>
<td>3,300,244</td>
</tr>
<tr>
<td>Capital and Surplus</td>
<td>29,306,529</td>
<td>2,821,320</td>
<td>3,347,084</td>
<td>20,918,693</td>
</tr>
<tr>
<td>Tons Traffic</td>
<td>105,965</td>
<td>75,654</td>
<td>528,304</td>
<td>84,566</td>
</tr>
<tr>
<td>Number of Vessels</td>
<td>55,200</td>
<td>7</td>
<td>109,163</td>
<td>8</td>
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<tr>
<td>Cargo Dead Weight Capacity</td>
<td>55,200</td>
<td>75,654</td>
<td></td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Operator</th>
<th>1948</th>
<th>1953</th>
<th>1948</th>
<th>1953</th>
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</thead>
<tbody>
<tr>
<td>Domestic Freight Revenue</td>
<td>8,386,741</td>
<td>31,813,554</td>
<td>5,735,355</td>
<td>10,498,026</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>32,068,026</td>
<td>20,669,224</td>
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<td></td>
</tr>
<tr>
<td>Operating Expense</td>
<td>35,347,966</td>
<td>45,130,145</td>
<td>21,952,040</td>
<td>14,299,231</td>
</tr>
<tr>
<td>Net Profit (After Taxes)</td>
<td>43,903,274</td>
<td>41,082,734</td>
<td>1,121,427</td>
<td>1,162,663</td>
</tr>
<tr>
<td>Total Assets</td>
<td>32,316,356</td>
<td>41,847,959</td>
<td>29,988,658</td>
<td>35,435,321</td>
</tr>
<tr>
<td>Current Assets</td>
<td>10,729,185</td>
<td>6,012,222</td>
<td>7,806,763</td>
<td>9,712,342</td>
</tr>
<tr>
<td>Capital and Surplus</td>
<td>19,549,940</td>
<td>26,800,129</td>
<td>23,098,430</td>
<td>28,334,769</td>
</tr>
<tr>
<td>Tons Traffic</td>
<td>314,043</td>
<td>1,207,194</td>
<td>237,069</td>
<td>473,015</td>
</tr>
<tr>
<td>Current Liabilities</td>
<td>4,381,223</td>
<td>6,012,452</td>
<td>4,600,376</td>
<td>2,345,213</td>
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<tr>
<td>Number of Vessels</td>
<td>40</td>
<td>16</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Cargo Dead Weight Capacity</td>
<td>449,037</td>
<td>163,452</td>
<td>336,208</td>
<td>68,252</td>
</tr>
</tbody>
</table>

NA — Not Available
D — Deficit

only by making great changes in their operations. Also, they have been aided by the withdrawal of these other companies.

The lack of profitability in this industry has impaired the financial position of many of the companies within the industry. The unprofitability of the industry is shown by Chart VI on the following page. These companies have been unable to obtain new investment capital at a fair price. In order to raise long-term investment capital, the companies must sell stock at a value far below par. The reason for the premium demanded by the investors is to make up for the historic lack of profitability of the industry.

The lack of investment capital at a fair price has greatly curtailed many of the companies plans for expansion. An example of this is the American Hawaiian Steamship Company which proposed to build four vessels of a new design for operating in the intercoastal trade. Not being able to raise the necessary funds, the company abandoned these plans and has ceased operation in the industry.
Table VI
NET PROFIT OR LOSS AFTER TAXES
OF SELECTED OPERATORS IN THE DOMESTIC
SHIPPING INDUSTRY
1953 - 1948

(In Dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>Pan Atlantic Steamship</th>
<th>Seatrain Lines</th>
<th>Newtex Steamship</th>
<th>Coastwise Lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>1953</td>
<td>$590,585</td>
<td>$1,861,440</td>
<td>$2,191</td>
<td>$200,044</td>
</tr>
<tr>
<td>1952</td>
<td>416,541</td>
<td>1,966,974</td>
<td>155,657</td>
<td>181,635</td>
</tr>
<tr>
<td>1950</td>
<td>247,115</td>
<td>2,165,377</td>
<td>182,989</td>
<td>379,112</td>
</tr>
<tr>
<td>1949</td>
<td>183,954</td>
<td>2,552,454</td>
<td>57,687</td>
<td>208,822</td>
</tr>
<tr>
<td>1948</td>
<td>305,542</td>
<td>2,555,672</td>
<td>N.A.</td>
<td>131,076</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Calmar Lines</th>
<th>Luckenbach Steamship</th>
<th>Pacific &amp; Talbot S.S.</th>
<th>Pope &amp; Talbot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1953</td>
<td>1,215,699</td>
<td>$1,082,734</td>
<td>383,652</td>
<td>1,162,668</td>
</tr>
<tr>
<td>1952</td>
<td>1,318,368</td>
<td>1,296,850</td>
<td>d115,196</td>
<td>1,569,768</td>
</tr>
<tr>
<td>1950</td>
<td>1,642,668</td>
<td>1,108,373</td>
<td>872,917</td>
<td>2,683,589</td>
</tr>
<tr>
<td>1949</td>
<td>1,410,226</td>
<td>1,906,174</td>
<td>319,588</td>
<td>1,067,123</td>
</tr>
<tr>
<td>1948</td>
<td>524,661</td>
<td>d3,403,234</td>
<td>332,221</td>
<td>1,121,437</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Waterman Steamship</th>
<th>Weyerhaeuser Steamship</th>
</tr>
</thead>
<tbody>
<tr>
<td>1953</td>
<td>d336,098</td>
<td>31,141</td>
</tr>
<tr>
<td>1952</td>
<td>d104,326</td>
<td>189,966</td>
</tr>
<tr>
<td>1950</td>
<td>d305,313</td>
<td>122,270</td>
</tr>
<tr>
<td>1949</td>
<td>d223,239</td>
<td>d14,719</td>
</tr>
<tr>
<td>1948</td>
<td>8,047,552</td>
<td>d233,297</td>
</tr>
</tbody>
</table>

N.A. - Not Available

IV. LABOR-MANAGEMENT RELATIONS

A. Significance of Labor Problems

Unstable labor-management relations in the domestic shipping industry have existed on the waterfront for over twenty years. These poor relations have shaken the faith of the shippers in the dependability of this industry's service.* There has not been any recent improvement in this relationship, as in 1957 the International Longshoremen's Union took part in a strike which tied up the entire shipping industry on the Atlantic and Gulf Coasts of the United States. This strike was settled only after the President of the United States obtained an injunction against the union, as authorized by the Labor-Management Relations Act. The act gives the President the right to seek an injunction against the strikers if public health or safety is endangered.

The many strikers, which have affected the domestic shipping industry, have caused a great monetary loss to all interests involved. The operators have lost a great deal of business, as the strikes have caused dissatisfaction and skepticism on the part of the shippers.** Shippers have lost confidence and faith in the domestic shipping industry, many of them are unwilling to further assume the risks involved in utilizing the industry's services. They will contin-

*1, p.102.
**13, p.18.
ue to avoid using these services until there is positive assurance, from all parties concerned, that the same frequent and severe conditions will not recur as they have in the past.

Another important aspect of labor-management relations is that much of the work involved in cargo handling is performed by manual labor. There is a great dependency on the individual employee for the amount of cargo handled in any given amount of time. The productivity of the longshoremen directly influences the cost of cargo handling. As in any industry, the productivity of the employees is affected by labor-management relations.

B. Collective Bargaining

l. Scope of the Agreements

The collective bargaining agreements between the longshoremen's union and the shipowners and stevedoring companies cover all aspects of employment. Many restrictions are placed on the companies in the agreements. Such restrictions include: the minimum number of men that will be hired at one time, the minimum number of hours they must be employed, when they can be hired, and sling-load limit restrictions. The first three restrictions are an attempt to provide the worker with steady employment. The load limit restriction is
placed by the union as a safety measure. In all cases, the load limit is far less than the safe working load of the equipment used. This restriction is a make work provision. The less that can be loaded at one time, the more time it will take to accomplish the work.*

2. The Bargaining Units

The bargaining unit for the longshoremen on the east coast is the International Longshoremen's Association. This union also has a Gulf Coast district, which represents longshoremen on the Gulf Coast. This union represents all longshoremen employed from Portland, Maine, to Corpus Christi, Texas, and has approximately 100,000 member.** This union bargains with various shipping associations in each port. The basic economic pattern for contractual relationships is set by the negotiations in New York City between the New York Shipping Association and the International Longshoremen's Union.*** The actual agreement reached in New York applies only in New York, but in recent years it has been adopted in all ports within the jurisdiction of the I.L.A.

The New York Shipping Association is a corporation whose primary purpose is to negotiate a contract with the I.L.A. The membership of the association is made up of ship-

*13, p.19.
**47, p.821.
***47, p.822.
owners and stevedoring companies. The association deals only with the personnel employed to handle cargo.*

The International Longshoremen's and Warehousemen's Union is the bargaining unit for the longshoremen employed on the Pacific Coast. The only Pacific Coast port, outside of the jurisdiction of the International Longshoremen's and Warehousemen's Union, is the port of Tacoma, Washington.** The port of Tacoma is affiliated with the International Brotherhood of Longshoremen, which was organized by the American Federation of Labor when the International Longshoremen's Association was dismissed from the Federation. The International Brotherhood of Longshoremen has not been at all successful in the organization of the longshoremen on the Atlantic Coast.

The Pacific Maritime Association membership is composed of American flag steamship companies, foreign-flag operators and their agents; also, various stevedoring companies and terminal operators in the Pacific Coast ports.*** The contract which this association negotiates is a master type contract. It applies to a single unit at all of the major ports on the Pacific Coast.**** The contract is binding upon the members of the association, unless they decline to accept its terms after notice is given.

*47, p.5, Sup.I.
**49, p.40.
***49, p.39.
****49, p.40.
3. Results of Collective Bargaining

The agreement entered into between the bargaining units contains provisions for management action. In the past, management has been unable to take advantage of these provisions. Mr. Sinclair, President and General Manager of Luckenbach Steamship Company, stated that, "the agreement reads all right. It looks like we could do almost anything if they don't produce, but it just does not work out that way." The union allows their members to work four hours and rest four hours. This means that the employer is obtaining work from only one-half of the gang he hired. Also, the longshoremen's union, in some ports, have refused to furnish all the gangs ordered by the shipowners. The reason for this is that they have a closed shop agreement and refuse to open their books to new members or to call non-union employees to fill in during peak loads. The pilferage of cargo by longshoremen runs to astronomical amounts.

Management has allowed these conditions to exist, even though the contract specifically provides that employees shall not engage in such practices. The labor unions have been able to put tremendous pressure on the employer. Due to the nature of the work and personnel employed, the employment

*49, p.166.
**49, p.514.
is casual and the employee is not, in some cases, interested in steady employment. There is no pressure inside the union to have steady employment. The union leaders have been free to engage in prolonged strikes and have had the support of their membership.

Management, working through the association, has never had complete co-operation from all members. All shipping companies that belong to the association do not have the same operating conditions.* This industry has never been in the financial position where it could stand a long strike. Any attempt by management to improve these conditions would either result in a strike or slow down. The workers would use some other excuse, rather than the issue which management is attempting to correct. The favorite excuse of the unions for strikes and slow downs is safety.

Management has not enjoyed good labor relations with the longshoremen's unions since the beginning of their dealings with them. The shipowners associations have not proven successful in this field and, in many cases, individual operators who negotiate their own contracts have had better labor relations with the unions than do the operators who bargain through the associations.

*32, p.68.
C. Wages

1. Whip Saw Effect

A factor influencing wages and collective bargaining in the domestic shipping industry is the whip saw effect. The two longshoremen’s unions contracts terminates on different dates. Any wage increase made to the union whose contract expires first will have to be bettered by the other union when its contract expires. The reason for this is that there exists a sense of competition between the two unions to see which can gain the greater benefits for their workers.

The House Committee on Merchant Marine and Fisheries held an extensive hearing on this problem. They tried to have both labor and management agree to a common termination date. This goal was never reached as neither side was willing to go more than half way. This whip saw effect still exists today and can only be eliminated by a common termination date for all collective bargaining agreements in force within the industry.

2. Wage Increase

The wage rate of longshoremen was 40¢ per hour for straight time in 1916. An increase of 10¢ per hour was granted in 1918. In January of 1919, when business started upward after the war, the wage became 65¢ per hour for straight time. In January, 1920, the wage rate was raised
to 80¢ per hour straight time and $1.20 for overtime. These wages were looked upon, at the time, as top level for the maritime industry. The wages proved to be too high over the next two years, as the volume of ocean traffic dropped sharply in 1922. The decline in business found the wage rate back to 75¢ per hour for straight time. One year later they were advanced to the 1920 level and remained there until 1930 when the depression again found them back to 75¢ per hour.

The wage rate after 1934 is shown in Table VII on the following page. Prior to this time, all longshoremen belonged to the International Longshoremen's Association, but in 1934 the Pacific coast broke away and formed the International Longshoremen's and Warehousemen's Union. On the east coast, the longshoremen were receiving overtime after eight hours; whereas, on the Pacific coast the workers received overtime after six hours of work. These wage rates given are the basic rate. The employer must also contribute 49¢ to vacation funds, welfare funds and insurance programs, at the present time.

Today, the wage rate of the longshoremen is three and a half times the prevailing wage in 1919 and more than twice the wage in 1939.**

*39, p.68.
**39, p.69.
## Table VII.

### LONGSHOREMEN'S WAGE RATE

1934 to 1954

(In Dollars Per Hour)

### Pacific Coast

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>General Cargo</td>
<td>.95</td>
<td>1.00</td>
<td>1.10</td>
<td>1.15</td>
<td>1.20</td>
<td>1.27</td>
<td>1.37</td>
<td>1.52</td>
<td>1.52</td>
<td>1.65</td>
<td>1.67</td>
<td>1.82</td>
<td>1.42</td>
<td>1.97</td>
<td>2.10</td>
<td>2.16</td>
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</tr>
<tr>
<td>Damaged Cargo</td>
<td>1.40</td>
<td>1.55</td>
<td>1.65</td>
<td>2.00</td>
<td>2.22</td>
<td>2.37</td>
<td>2.42</td>
<td>2.52</td>
<td>2.52</td>
<td>2.67</td>
<td>2.77</td>
<td>2.82</td>
<td>2.95</td>
<td>3.01</td>
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<td></td>
</tr>
<tr>
<td>Overtime #</td>
<td>1.40</td>
<td>1.50</td>
<td>1.65</td>
<td>1.72</td>
<td>2.05</td>
<td>2.28</td>
<td>2.35</td>
<td>2.47</td>
<td>2.50</td>
<td>2.73</td>
<td>2.83</td>
<td>2.95</td>
<td>3.15</td>
<td>3.24</td>
<td></td>
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</tbody>
</table>

### Atlantic Coast

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>General Cargo</td>
<td>.95</td>
<td>1.00</td>
<td>1.05</td>
<td>1.10</td>
<td>1.25</td>
<td>1.50</td>
<td>1.65</td>
<td>1.78</td>
<td>1.88</td>
<td>2.00</td>
<td>2.10</td>
<td>2.27</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Damaged Cargo</td>
<td>1.90</td>
<td>2.00</td>
<td>2.10</td>
<td>2.20</td>
<td>2.40</td>
<td>2.50</td>
<td>3.00</td>
<td>3.30</td>
<td>3.40</td>
<td>3.66</td>
<td>3.90</td>
<td>4.10</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overtime</td>
<td>1.35</td>
<td>1.50</td>
<td>1.60</td>
<td>1.65</td>
<td>1.80</td>
<td>1.87</td>
<td>2.25</td>
<td>2.47</td>
<td>2.62</td>
<td>2.82</td>
<td>3.00</td>
<td>3.15</td>
<td>3.40</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

#Based on a six hour day.

D. Productivity

1. Decline in Productivity

The productivity of longshoremen has been the subject of many discussions. No studies have been made since 1930 when one was made by the Bureau of Labor Statistics.* This study was not continued by the bureau and has never been brought up to date. The report states that the productivity of the longshoremen in loading or discharging is dependent upon the multiplicity of variable factors involved in cargo handling.**

Table VIII contains a brief summary of the productivity of the longshoremen in three of the more important ports.

Table VIII

PRODUCTIVITY OF LONGSHOREMEN FOR SELECTIVE PORTS IN 1930

(In revenue tons output per man hour)

<table>
<thead>
<tr>
<th>Port</th>
<th>Discharging</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>.93</td>
<td>.75</td>
</tr>
<tr>
<td>New Orleans</td>
<td>.67</td>
<td>.87</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>1.28</td>
<td>1.25</td>
</tr>
</tbody>
</table>


*41, p.2.
**41, p.4.
The actual number of tons per man is, in some cases, lower now than it was twenty-five years ago.* Mr. C.L. Saurbier stated, in the same article, that an example of this condition is the magnificent port of Los Angeles and Long Beach Harbor in California. In this port, there are modern piers with extra wide aprons, spacious dock sheds, smooth roadways, and railway spur tracks connecting all pier aprons. The productivity of labor has dropped over the years, despite the improvement of the harbor facilities and the availability of modern materials handling equipment and techniques. In 1928 the output per man hour in the port was 1.54 tons for loading and 1.60 tons for discharging. Today, the average for loading and discharging cargo is approximately .4 tons per man hour.**

Table IX shows that there has been a definite decline in the productivity of longshoremen. This condition does not exist in all ports. The common belief is that productivity is better on the east coast than on the west coast.***

2. Reasons for the Decline in Productivity

Captain C.L. Saurbier attributes the decline in productivity of longshoremen almost entirely to poor labor-management relations.**** This statement is valid and holds true

*35, p.83.
**35, p.84.
***47, p.140.
****35, p.85.
even in cases where the decline has been only slight. The conditions that management allows to exist, as noted under "The Results of Collective Bargaining", have a direct influence on the productivity of the longshoremen.

Table IX

PRODUCTIVITY OF LONGSHOREMEN,

PACIFIC COAST MARITIME INDUSTRY

1934 to 1953

<table>
<thead>
<tr>
<th>Year</th>
<th>Tons Per Man Hour</th>
<th>Man Hours Per Ton</th>
<th>Average Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1933</td>
<td>1.59</td>
<td>.630</td>
<td>$ .84</td>
</tr>
<tr>
<td>1934</td>
<td>1.42</td>
<td>.704</td>
<td>1.120</td>
</tr>
<tr>
<td>1935</td>
<td>1.35</td>
<td>.747</td>
<td>1.167</td>
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<tr>
<td>1936</td>
<td>1.04</td>
<td>.962</td>
<td>1.168</td>
</tr>
<tr>
<td>1937</td>
<td></td>
<td></td>
<td>1.15</td>
</tr>
<tr>
<td>1938</td>
<td>.95</td>
<td>1.055</td>
<td>1.158</td>
</tr>
<tr>
<td>1939</td>
<td>.94</td>
<td>1.108</td>
<td>1.160</td>
</tr>
<tr>
<td>1940</td>
<td>1.1554</td>
<td></td>
<td>1.450</td>
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<tr>
<td>1941</td>
<td>.75</td>
<td></td>
<td>1.79</td>
</tr>
<tr>
<td>1942</td>
<td>.688</td>
<td>1.453</td>
<td>2.185</td>
</tr>
<tr>
<td>1943</td>
<td>.745</td>
<td>1.342</td>
<td>2.429</td>
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<tr>
<td>1944</td>
<td>.700</td>
<td>1.427</td>
<td>2.498</td>
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<tr>
<td>1945</td>
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<td>1.563</td>
<td>2.613</td>
</tr>
<tr>
<td>1946</td>
<td>.716</td>
<td>1.396</td>
<td>2.812</td>
</tr>
<tr>
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Mr. Edward Hunter, Vice-President and Assistant to the President of Pope & Talbot, once stated that, if his company could secure a 20% increase in productivity of labor on the west coast, a saving of a half million dollars would be realized.* This could be accomplished with only a little ef-

*47, p.140.
fort and a complete change of attitude on the part of the Longshoreman's Union. It could be accomplished only if labor-management relations between the parties improved.

Another possible reason for the decline in the productivity is that there is no direct connection between output and wages. Neither labor nor management regard a piece rate or incentive system of payment with favor. A piece rate system is employed in England and has proved workable.**

The safety of longshoremen is another factor that could influence productivity. The injury frequency for the longshoremen was 92 in 1954, as compared to 12 in all manufacturing.*** The average cost for compensation per case is $655.**** The high frequency rate and the amount of compensation shows that many injuries occur which cost the companies a great deal of money. This safety hazard to longshoremen is real and, without a doubt, has influenced their productivity. There is some work being done in this area of safety as the contracts governing employment contain safety codes, but they are not followed by the employees or enforced by management.

**8, p.6.
***8, p.7.
****11, p.19.
******11, p.62.
V. MANAGEMENT'S EFFORTS TO IMPROVE CARGO HANDLING

A. Packaging

1. Importance of Packaging

The package which contains the cargo to be shipped influences many aspects of cargo handling. The size and shape of the package will be determined by its contents. The size and shape of the package will determine the cargo handling characteristics of the shipment. These factors determine whether or not the cargo can be palletized. Also, the amount of damage to a shipment will be determined by the strength of the package and its ability to withstand the handling necessary to move it. A properly designed and constructed package will usually insure that the cargo will reach its destination without damage. As damaged cargo amounts to such a large percentage of revenue, the best investment of both the shipper and the domestic operators are served when the cargo influences the productivity of the longshore gang. Ton productivity of the longshore gang rises as package size increases beyond four cubic feet per unit.*

2. Improvement of Packaging

Most package improvements are made by the companies who manufacture the packages. They do this as part of their

*9, p.41.
sales program and as a service to the customer. The domestic operator may be able to suggest to the shipper new methods of packaging that will enable both of them to benefit. The operator's claims department, by analyzing all claims, can point out what cargo is most susceptible to damage. Then, the company's sales force can visit with the shipper and possibly suggest improvements. These improvements may be for other reasons than prevention of damage. The suggestions of the domestic operator may allow the shipper to take advantage of a lower rate by changing the method of packaging.

B. Scheduling

1. Receipt and Delivery of Cargo at the Terminal

The improvements made in the receipt and delivery of cargo is that management has provided mechanical equipment to facilitate the movement of cargo between the terminal and the truck dock or railroad siding. As increased use of pallets has taken place, this transfer is facilitated by fork lift trucks.

Management has exercised closer control over the arrival of trucks and railroad cars to avoid congestion at the terminal. With the use of mechanical equipment, the time it takes to deliver the cargo at the terminal has been reduced. This has reduced the congestion and increased the number of deliveries that can be made in a given day.
2. Vessels

In the scheduling of vessels, management has been able to make only slight improvements. This is due to the many uncontrollable variables which determine the time when a vessel will arrive in port. Management has been able to schedule the vessels so that excessive overtime is not incurred when it either arrives or leaves a port. In many cases, it is still advisable to pay overtime to the vessel's crew, rather than to the longshoremen, as the cost is less to the shipowner. There are more longshoremen involved than ship crew members as the cost is less to the shipowner. There are more longshoremen involved than ship crew members and the overtime rate per hour for the crew members is less.

C. Methods Improvement in Cargo Handling

1. Use of Materials Handling Equipment

Progress in handling materials efficiently can be accomplished by the adoption of a different point of view within the industry, by an understanding of cargo handling principles, and knowledge of successful as well as unsuccessful equipment.* The adoption of a different point of view will, in most cases, be a long time in coming. The principles of materials handling are outlined in many publications and are mostly a matter of common sense and maximum utilization of the equipment on the job it is best suited for. A complete

*3, p.4.
and detailed list of these principles are contained in *Materials Handling* by Harvey E. Stocker. The exchange of information within the industry is accomplished by trade papers and the personal contacts that management has with others in the industry. As in other industries, it is much easier to find out about successful operations; unsuccessful attempts to improve operations are hardly ever mentioned. Therefore, management, before trying to introduce any new system, should first find out if it has ever been tried before and proven to be unsuccessful.

The advances made in materials handling equipment has occurred through the research conducted by the manufacturers of the equipment. The equipment has been steadily improved upon. These improvements have made the equipment smaller in size but able to lift or carry more weight. Also, the speed and capacity has been increased and control of the equipment made easier and more exact. These improvements in the equipment have added greatly to its productive capacity.

Management has provided the terminal with some of the new and improved equipment, such as a fork lift truck, but this equipment has never been utilized to the full extent of its productive capacity. The reason for this is the distrust of labor. Management has, in some cases, refused to purchase new and improved equipment as the equipment they now have provided the dock force with is not being used to its fullest capacity.
2. Palletizing of Cargo

a. Advantages

When cargo is palletized, a number of small packages are made into a larger single unit. This unit can be picked up by a fork lift truck and can be moved from place to place without re-handling of each individual package. This single unit can be moved by the truck in much less time than it could be moved if each individual package was picked up and carried by a workman. The movement of cargo on pallets in the terminal has proven to be very economical as stowage space can be saved, as the palletized cargo can be stowed on top of each other by mechanical equipment. The combined factor of greater speed of movement and saved floor space demands that it be used in the terminal. This is only true where the palletized cargos do not interfere with further operations.

The advantage of palletized cargo diminishes when the cargo is loaded aboard the vessel. The reason for this is that load restrictions are placed by the union on the weight that can be loaded at one time. As some of the palletized units exceed this restriction, they cannot be loaded as a single unit but must be broken down into smaller units. As the primary objective of palletizing the cargo is to increase the unit's load as much as possible, the restriction overbalances the advantages.
A small company operating in the Chesapeake Bay area utilizes a palletized system entirely. The vessels are small and are loaded through side ports. This allows the pallets to be carried onto the vessel by mechanical equipment. The operation has been used for seven years and has proven very successful. The equipment consists of twenty-five Clark fork lift trucks. The company reports that, despite the rough handling conditions characteristic of dock side handling operations to which the trucks are subject, they have stood up much better than expected.*

If management had no restrictions placed on it by labor, then a complete palletized operation might prove feasible. Some types of cargo would still have to be loaded by slings or hooks, due to its nature. In theory, a complete palletized operation would result in tremendous saving, both in labor cost and vessel port time, but it does not work out that way.

b. Disadvantages

One universal disadvantage of a palletized operation is that the pallets take up space.** Another is that difficulty is encountered in the stowage of palletized cargo in the vessel's hold. In some ports the union prevents management from stowing palletized units in the hold. This is

*20, p.47.
**3, p.18.
another example of a union make work provision. If the cargo has to be unpalletized and manually stowed, the advantages of palletizing are gone. There is a cost involved in palletizing cargo and, if the cost cannot be saved by lowering cargo handling costs, there is no advantage in palletizing.

Pallets are being used in the domestic shipping industry and have been for some time. Their use has not resulted in any noticeable reduction in the cost of cargo handling. They have not increased the productivity of labor, due to union resistance, which prevents their maximum utilization. They are used, in some cases, because they are already made up when they are received at the marine terminal.

The main reason that palletizing has not resulted in lower cargo handling cost is that they do not eliminate the bottle neck in the operation. For many years the hold gang was thought to be the bottle neck of the operation. In a study made recently by the Maritime Cargo Transportation Conference, this was proved to be false. They proved that the hook cycle is the bottle neck.* The hold gang is not the bottle neck since it is idle over 40% of the time waiting for the hook to deliver cargo.**

*10, p.2.
**10, p.16.
3. Using Containers

a. Advantages

A container, in most cases, is a metal box. It is constructed of light metal and weighs about 1,000 pounds. The container, when loaded, will weigh about 10,000 pounds. The containers are manufactured and either sold or rented to the shipper or domestic operator.

The container is loaded with cargo and then moved as a unit from origin to destination. The cargo, in a container, is subject to very little damage and, as it can be locked, there is very little pilferage of cargo.* Loading of a container aboard a vessel is less expensive per ton of cargo than conventional or palletized systems. Also, the time taken to load a vessel with containers is less than by other systems.**

Containers are used only to a limited extent in the domestic shipping industry. They are used mainly as stowage places for valuable cargo to prevent pilferage and damage to it.***

b. Disadvantages

The container has certain disadvantages which has prevented its use becoming general throughout the industry

*12, p.13.
**12, p.65.
***33, p.31.
The amount of space taken up by a container of cargo is more than would be occupied by the same amount of cargo stowed in the conventional manner. Also, the weight of the container is more than that of the cargo alone. The container costs money to use as it is either rented per day or bought and depreciated over a period of time. If there is no cargo for the return movement, then the container must be returned empty. In the domestic trade, there is not a balanced movement of cargo to fill the container both ways.* The cost of loading the container and transporting it is greater than the cost of handling the same amount of cargo in the conventional manner.** The only factor which can overcome this cost is the amount of loss or damage to the cargo that may be prevented by the use of containers.

4. Unit Loads

There is a great deal of lumber carried in the intercoastal trade and by pre-packaging the lumber into unit loads, cargo handling cost has been lowered and port time for the vessel has been reduced.*** The difficulty with unit loads is that they require special gear to handle them as the materials handling equipment in common use does not have the weight capacity to handle them. The operation mentioned

*6, p.9.
**12, p.5.
***49, p.133.
above has had the most success in the Weyerhaeuser Steamship Co. This is due to the fact that their parent company manufactures the lumber and pre-packages it at their plant in the correct size to facilitate materials handling and stowage. In the domestic industry, lumber is the only commodity which readily adopts itself to unit loads. The full capability of the system is not gained as the same number of longshoremen must be employed to load the unit as it takes to load it by the conventional method.*

*Newsprint is being carried on the west coast in large unit loads by the Coastwise Lines. Special skids carry eight tons of newsprint and are handled with special heavy duty materials handling equipment. A five ton capacity lift truck is carried as part of the vessel gear to stow the skids in the hold. No information is available as to the cargo handling saving of this new system.**

5. Improvements Made in the Vessel

a. Quick Opening Hatches

The conventional hatch cover has always presented a problem as they have to be removed prior to loading or discharging cargo. The time spent by the longshoremen in removing the hatch covers is dead time, time in which no cargo

*37, p.132.
**23, p.36.
is handled. The hatches have to be uncovered every morning and covered every night to protect the cargo from the weather. The hatch covers are always stowed beside the hatches and prevented free movement of the signalman and are a safety hazard.

The new quick opening hatches, that can be automatically operated, fold up at each end of the hold and are out of everyone's way. It takes only a matter of minutes to open the hatch and the work involved is negligible.

b. Unit Cranes

For many years the boom and winch method of handling ship's cargo has been accepted as the most practicable method to employ for self-unloading and self-loading. Arising from the trend towards specialized packaged cargo which cannot be handled by the existing cargo gear, management has questioned the efficiency of the present system. They have made comparisons with other available equipment of a different type.

One of the first companies to use the new type of gear was the Olson Company. They had installed two unit cranes on one of their vessels, one fore and one aft. The cranes have a fifty foot boom and a capacity of ten tons. The machinery is enclosed in a house to protect it from salt water. The cranes have their own source of power and

*17, p.46.
and are able to operate independent of the vessel. The operator of a crane rides in an enclosed cab, which is a much more protected position than that of a winch driver.*

The cargo handling cost of loading unitized loads of lumber with the unit crane is only 7% of revenue, as opposed to 50% for the conventional system.**

c. Positive Load Control Crane

One of the complaints about the unit crane was that there was no positive control over the load. There was no means to keep it from swinging back and forth. When the crane swings the cargo inboard, the operator has no control over the cargo. The operator would have to wait until the cargo stopped swinging before he could lower it through the hatch. If he didn't, the cargo would hit the side of the hatch and be damaged.***

The positive load control crane was designed by Captain P.C. Farrell. It was designed to prevent the cargo from swinging, as the operator has full control of the cargo at all times. Another boom is added to the crane and a whip is run from each boom to the hook. This method cut practically all swing as the load is suspended from two points instead of one, as in the unit crane.****

*17, p.47.
**45, p.30.
***40, p.143.
****40, p.143.
D. Research in Cargo Handling

1. By Companies and the Industry

The management of the individual companies, in the domestic shipping industry, have engaged in very little research. What research has been undertaken by them has been of an applied nature and applicable only to some special operation unique with their company. There are some exceptions to this general rule. The exceptions are companies where management is contemplating or is engaged in a special type of operation to be covered in the next chapter.

The reason for this lack of research by the majority of the companies is that the cost of a research program would be too great a burden for them to bear. Many of the companies are operating at a loss, or near to it, and can't afford to spend money on research. Another reason is that management has deemed the expense of research for new cargo handling techniques useless as labor agreements, in many cases, prevent any improvements from being used effectively.

The domestic shipping industry has never collectively engaged in any research. The reasons for this is the inability on the part of management within the industry to see what gains could be made from collective research. The short range point of view of many of the companies' management will seriously hinder any future growth possibility.

*19, p. 42.
**19, p. 43.
that the industry could have if all management within the indus-
try is unwilling to co-operate.

2. Private Organizations

Most of the research done in this area is done by manufacturers of materials handling equipment. The suppliers of this equipment, in order to keep up their sales volume and better their competitive position, have made many im-
provements on equipment through research.

There are two organizations in this area who have contributed much in the field of research on cargo handling. The Association of Marine Engineers and Naval Architects is a professional organization which is interested in ship de-
sign primarily but discusses cargo handling as it is effect-
ed by ship design. The association provides a means of ex-
change of information among its members. The exchange of in-
formation is of great value in research.

The Maritime Cargo Transportation Conference is part of the National Academy of Science - National Research Council. It consists of a board of directors and a full time staff. The board of directors consists of leaders in various pertinent phases of transportation, government, in-
dustry, and academic institutions. The objectives of the conference is to assist in the solution of cargo handling

*16, p.67.*
problems and stimulate and encourage research as a scientific method of solving problems. The conference will conduct research programs of a general nature, but will not attempt to solve the problems of any individual operator. This conference has made four studies which have been very informative and point out the places where the problems lay.*

3. By Government Agencies

The two government agencies which have undertaken research into cargo handling are: The Office of Naval Research and the United States Maritime Administration. These two agencies jointly sponsored a project conducted by the Department of Engineers of the University of California at Los Angeles in 1953 called "An Engineering Analysis of Cargo Handling".** The object of the study is to formulate equations that state the relations between significant components of the cargo handling system in terms of time and cost.

*16, p.67.
**2, p.518.
VI. SEA-LAND SERVICE
A SOLUTION TO MANAGEMENT'S CARGO HANDLING PROBLEMS

A. Background

Sea-land service is an improvement on the container service discussed in the previous chapter. In this case, the container is a much larger unit. At the present time, there are two basic types of service in operation; classified by the method used to load the container onto the vessels. One is the lift-on, lift-off method. The other is the roll-on, roll-off method. The lift-on, lift-off method uses a crane to lift the container onto the vessel. The roll-on, roll-off method utilizes wheels to move the container aboard the vessel.

There are three basic types of containers presently being used. They are: railroad freight cars, truck trailers and truck trailer bodies. By using this type of container, it has been possible to use the best part of both sea and land transportation; the speed and versatility of the land service with the economies of water service. Each type of container has distinct advantages and disadvantages which will be discussed with each operation.

Management of the companies engaged in sea-land service have been able to lower the cargo handling cost per ton of cargo. This has been done by increasing the unit load that is handled, increasing the speed with which it is
loaded and increasing the productivity of the longshoremen.\(^\ast\)
The primary reason for this is that manual handling of the cargo has been reduced to a minimum. As the number of handleings has decreased, the damage to cargo has decreased.

The remainder of this chapter will be devoted to a discussion of each service offered in the domestic shipping industry, with particular emphasis on the cargo handling problems of management that have been eliminated and any new problems that have been encountered.

B. Seatrain Line

1. The Operation

The Seatrain Company utilizes six specially designed vessels on a regular schedule between New York, Savannah, New Orleans, and Galveston. The vessels machinery is aft and the deck house forward. This makes it possible for the freight cars to be stowed in the part of the vessel most suited for stowage of cargo. The entire midsection of the vessel provides unobstructed stowage for the freight cars. They are stowed on four decks fitted with railroad tracks and secured to the tracks by turn buckles and chains.\(\ast\ast\)

The freight cars are loaded by a mammoth 125 ton loading crane. The crane picks up a platform containing

\(^\ast\)2, p. 503.
\(^\ast\ast\)28, p. 81.
tracks onto which the car has been rolled. The platform and car are lifted aboard the vessel where the platform fits into the hatch and the tracks on it meet with the tracks in the hold and the car is rolled from the platform to its stowage place.

The vessel can be loaded with one hundred freight cars in six hours which has greatly increased the vessels' at sea time. The speed of loading and number of employees required has greatly reduced cargo handling costs over the conventional break-bulk system.

2. Effect on Cargo Handling

Management of the Seatrain Company were pioneers in adaptation of sea-land service to commercial use. This company commenced operation in 1929 and was successful from the start, when it demonstrated that it could use the freight cars as a basic ocean going container, hoisting loaded cars aboard a vessel and sailing them to their destination.

The effect on management's cargo handling problems, using this method as compared to the conventional break-bulk system, has been to lessen the significance of cargo handling. The system, as much as possible, does away with cargo handling. The cost of cargo handling has been reduced to almost an

**28, p. 82.**

**27, p. 106.**
irreducible minimum of $2.7\%$ of revenue.\textsuperscript{*} The cost of the entire terminal operation is only $10\%$ of revenue.\textsuperscript{**}

The railroad freight cars are loaded by the shipper at his plant and taken to the port via railways and there loaded aboard the Seatrain vessel. The vessel then carries the cars to their port of destination where they are unloaded and taken to the consignees by the railroads. The Seatrain Company does not handle any of the cargo manually; it is all handled by mechanical equipment.

The labor involved is of a different type as the company employs its longshoremen on a steady basis, this allows for better control of the employees by management. As the number of longshore employees is drastically reduced, the personnel problems of management are drastically reduced. Labor-management relations of the company, in the area of cargo handling, have been on a co-operative basis for some time and continue to be so today. This has allowed management to operate the system to the full extent of its capabilities.

The receipt, delivery and stowage problem at the terminal is still present, but now it is only the problem of marshalling the cars in their proper order to be loaded aboard the vessel. No longer does cargo have to be removed

\textsuperscript{*}45, p.30.
\textsuperscript{**}14, p.5.
from the cars and stowed in the terminal, as the freight cars act as transit sheds. The management still has a problem of where to stow the cars, but it is of less importance. The only concern now is to place the weight of the cars so that an even weight is distributed throughout the vessel in such a manner as to insure the stability of the vessel.

The stowing of cars in the hold presents a problem in how to secure the cars that are on tracks so that they will not move. The system used presently is that the axles of the cars are secured to the vessel's deck by means of a chain and turn buckle. This method of securing the cars is costly and time consuming. It is an area for management action, to find a better method of securing the cars for sea.*

The vessels do not have to be completely discharged before loading can commence. After a few of the cars have been unloaded, the crane can transfer loaded cars in both directions. This permits maximum utilization of the crane, which is the controlling factor in the cargo handling process.

C. Pan Atlantic Steamship Corporation

1. The Operation

Pan Atlantic Steamship Corporation, a subsidiary of McLean Industries, is presently operating two converted C-2

*22, p. 82.
vessels in the domestic industry between New York and Houston, Texas. These vessels have been converted to trailer container carriers. The container is a truck trailer body which is detachable from the chassis. Only the body itself is loaded aboard the vessel, the chassis with their wheels remain on the pier. The vessel was converted by removing all the conventional cargo handling gear and replacing it with two deck mounted twenty-five ton traveling cranes.* These cranes, which can be extended out over the side of the vessel, lift the truck bodies from their chassis and deposit them in the vessel's hold. The crane is capable of loading and unloading one trailer body in about five minutes. The cost of converting these vessels was 3.6 million dollars per vessel. This was spent installing the cranes and widening the vessel's hatches to extend the full width of the deck and adding sponsons along the side of the vessel.**

The management of this company did not enter this field blindly. Prior to 1952, when McLean Industries bought Pan Atlantic, the top management was in control of McLean Trucking Company. Before spending the 3.5 million dollars to convert the vessels, Pan Atlantic operated four tankers in this trade which carried sixty trailers as a deck cargo. The success of this small scale operation lead management to believe that it was a sound system and should be expanded.***

*27, p.108.
**27, p.110.
***24, p.67.
The converted vessel can carry 226 loaded 35 ft. trailer bodies. The two cranes can completely unload and reload a full cargo in eight to ten hours with only two, fifteen men gangs of longshoremen working. For a comparison, it takes as many as five, twenty-two men gangs a week to load the same type of vessel with the conventional method.

The company owns 4,500 special 35 ft. trailer bodies, 2,500 quick release chassis and close to 300 tractors to move the trailers from the companies' terminal to the pier.

2. Effect on Cargo Handling Problems

The new system introduced by Pan Atlantic has practically solved many of the problems that management had when the conventional systems of cargo handling were used. The company operated as a coastwise carrier in the domestic trade and used the standard cargo handling systems, prior to the introduction of the new system. The new system has cut the cost of cargo handling from $8 to $10 per ton to 80¢ per ton. This was accomplished by greater speed of cargo handling and using less labor. Also, an advantage in vessel's turn around time was gained by the new system, as in the Seatrain system.

The system has been able to by-pass the bottlenecks of the conventional system, but from an over-all point of view, the cargo handling problems of management have been increased. In order for management to make full use of the capabilities
of the system, the entire operation has to be co-ordinated with a high degree of efficiency. The company does not haul the trailers to or from the port. This is done by carriers working under contract with Pan Atlantic. The company now must not only sell the space to the shipper, but also is responsible for the trailers reaching the shipper’s plant at the correct time so that it can be loaded and moved to the port in order to meet the schedule of the vessel it is to be carried on. The company is also responsible for having the trailer delivered upon reaching the port of discharge.

The problem of co-ordination of the movement of the trailers has taken the place of the cargo handling problem which the system by-passes. The problem of co-ordination is not as difficult to solve as were those of the cargo handling system that it replaced. Management has direct control over the movement of cargo that is shipped via its system from the time it leaves the shipper’s plant until it reaches its destination. The movement of the trailers is not subject to the restrictions placed on the conventional system by labor. The problem of co-ordination can be solved by management employing a scientific method. Management must constantly keep positive control of the co-ordination of the system as the very success of the system depends on the degree to which it is co-ordinated. Without proper co-ordination, the variable cost of the system will become excessive. If the variable cost of the system becomes too high, the
system will prove unprofitable as it is already carrying a large fixed burden. This fixed burden includes the conversion of the vessels and the equipment used in the system: trailer bodies, chassis, and tractors. The cost of the terminal facilities' improvement must also be carried by the system.

The terminal facilities provided for the use of the system consist of; a pier at which the trailer bodies can be loaded and a warehouse or terminal at which less than truck load shipments can be received, stowed temporarily and loaded into the trailers. The cargo handling cost for loading the trailer is 40% per ton. This does not include the cost of terminals, only the cost of loading and discharging the vessel. The total cost of terminal facilities and cargo handling would probably run between $2.00 and $4.00 per ton of cargo.

Management of this company is pleased with the results obtained. At present, it is converting four more of its vessels to container carriers and they plan to have them in operation in late 1958.

D. Roll-On, Roll-Off System

1. The Operation

At the present time there are no operators who offer a roll-on, roll-off system of operation in the domestic
shipping industry. There is only one roll-on, roll-off system operating and that is T.M.T. Trailer Ferry which offers service between Florida and Puerto Rico, which is not in the domestic shipping industry.

Pacific Trailerships, Inc. has proposed plans for a roll-on, roll-off operation between San Francisco and Los Angeles.* Until recently, the American-Hawaiian Steamship Company had planned to build eight trailer ships at twenty million dollars each.** There were to have operated in the intercoastal trade.

A roll-on, roll-off system involves building a vessel especially designed to facilitate the loading and unloading of truck trailers without hoisting them aboard the vessel. Most contemplated plans are for a vessel able to carry 200 to 500 trailers, which would be driven on and off the vessel over ramps. The roll-on, roll-off vessels planned are glorified sea-going ferry boats.

The plan calls for either one or two decks on which to place the trailers, depending on the designed capacity of the vessel, and open stowage on the main deck. The deck on which the trailers are to be loaded are free of stantions to allow the trailers to be driven on. Access to the main deck is via a ramp inside the ship. The port facilities necessary

*22, p.45.
**27, p.37.
to operate a roll-on, roll-off service is a pier where the vessel can be backed in with long, gently inclined ramps, the height of which can be adjusted to compensate for the differing heights of the vessel as it is loaded and unloaded. The trailer carried would not have to be of any special design as any over the road trailers could be accommodated.

2. Effect on Management’s Cargo Handling Problems

Most proposed plans call for the company to carry only the trailers of trucking companies not their own. This would leave management free from having to co-ordinate the movement of all the trailers they will have to carry. As in the case of the other types of service; the roll-on, roll-off system would decrease the cost of cargo handling. Since the company would be hauling the trailers for a trucking company, private or industrial carrier, it would not be handling the cargo except in moving the already loaded trailers aboard the vessel.

The loading of a vessel using a roll-on, roll-off system can be accomplished in a short time, using only a few men. The management would have to provide some small tractors with a high degree of maneuverability, capable of pulling the trailers up the ramps and maneuvering them into position. The trailer would have to be secured for sea. The method presently used by T.M.T. Trailer Ferry Company is to
use wire rope and turnbuckles equipped with a pelican hook to facilitate quick release.*

The speed with which the trailers can be loaded has reduced cargo handling costs and decreased the time a vessel will spend in port, as is the case in the other systems. This system has never been tried out on a large scale basis and there are still many unknown factors involved in its operation. The management of any company, before entering a roll-on, roll-off service, will have to study the situation very carefully as many of the proposed economies may not actually exist when the system is tried on a large scale basis.

*15, p. 23.
VII. AN EVALUATION OF MANAGEMENT’S
ATTEMPT TO IMPROVE CARGO HANDLING

A. Conventional System

The attempts of management to improve the conventional break bulk method of cargo handling have not proven to be very successful. The basic ideas that management has had for improving the system have been sound and, in most cases, would have worked out if the improvements had not conflicted with the attitude of labor. The attitude of labor has been the predominant factor that has caused many of the improvement made by management to be ineffective. The improvements have never been utilized to the full extent of their productive capabilities.

Management is limited by the system itself as the basis of the system places a restriction on the amount of improvement that can be made on it. However, there are certain areas where significant improvements can be made on the system.* Management, if it hopes to maintain a profitable operation, must make these improvements. Many of the areas where improvements can be made are controlled by the attitude of labor. In fact, it is the attitude of labor which makes these improvements necessary. The improvements would not be to the system itself as much as to the way in which the system is presently being employed. The system has a great-

*16, p. 67.
er productive capacity than is presently being realized from it. This is caused by the make work and slow down restrictions placed on the system by labor.

It is in the area of labor relations where management has the opportunity to make improvements which will result in greatly increasing the productivity of the system. In order for management to take advantage of this opportunity, good labor-management relations must first be established. The advantage to management in establishing good labor relations is that they would be able to increase the productivity of the system without making any changes in the system. The benefits to management would be immense and well worth the time and effort they would have to expend, as the benefits would far exceed the cost.

Labor relations are so poor within this industry that labor has no faith in management whatsoever. On the other hand, management has for a long time completely distrusted labor to the extent that there is, at best, an armed truce between them. Sometimes, when this armed truce breaks down, open fighting breaks out. Management must convince labor that, in order for them both to survive and continue to prosper, there must be compromises on both sides, not by management alone as in the past. Management must sell itself to labor to get their co-operation and trust.
Part of the poor labor-management relations are due to the casualness of employment and insecurity of the worker. To overcome this basic drawback, management must attempt to provide steady employment for as many employees as possible. By providing security for the worker, management will have an opportunity to influence his thinking.

One of the best arguments management can use for union cooperation is that the company is loosing money and, if profitability does not increase, the company will be forced to leave the domestic shipping industry as other companies have done in the past. The number of jobs available to longshoremen would thereby be reduced, proving to the employee that it is better to co-operate with management than to face losing his job.

Management should not believe that labor-management relations can be improved overnight. A constant effort must be exercised by management to improve these relations. A crash program will not improve relations and, without a doubt, will impair any progress that has been made. To improve labor-management relations to the point where each is co-operative to the fullest extent will take a long time.

The areas of the system that can be improved without interference on the part of labor must be exploited to the fullest extent by management to offset the restrictions.

*46, p.85.
imposed by labor. It is in these areas that management must direct its attention first, hoping that by the time these improvements have been instituted the labor-management relations will have matured to a point sufficient to allow correction of the deficiencies in other areas. The areas where improvements can be made will be pointed out by the research being conducted by outside agencies. Management must not expect that these agencies will solve their individual problems, they will only show the way. It must conduct research in the areas shown and analyze the results as they apply to the company's operation. It must also keep in mind that, due to the nature of the conventional system, the gains from any improvements will be small. In order to secure greater gains, management must investigate other systems designed to avoid the use of the conventional system. Such systems were discussed in Chapter VI under the title of, "Sea-Land Services".

B. Research

Of the many agencies that are engaged in research, the two which will be most helpful in aiding management to solve their cargo handling problems are: (The Maritime Cargo Transportation Congerence and the Joint Project of the Office of Naval Research and Maritime Administration.) The work that is being done by these agencies is of a basic nature at the present time. As the study of cargo handling proceeds, more
pertinent information will be disseminated for management's use.

The project undertaken by the University of California for the United States Navy and Maritime Administration is of the pure research nature. It is the first time that anyone has approached the problem of cargo handling from an engineering standpoint. The study is of a continuous nature and in the near future it is expected that some of the basic engineering principles learned from these studies will be applied to specific cargo handling problems.

The Maritime Cargo Transportation Conference has made four preliminary studies which have pointed out areas in the break bulk system that requires further investigation. The conference is presently engaged in making a complete study of all sea-land services, which should make available much pertinent data which is not available now. The conference, through its continuing efforts in research, will be able to show management areas where improvement can be made. It is up to management to make use of the information.

Prior to making a study of shiploading, the conference sent questionnaires to shipowners asking their opinion on which segment of the conventional cargo handling system was the most inefficient and retarded the full utilization of the system. The opinion of management, in answer to the

\[10, \ p.4.\]
questionnaire, was that the hold gang was the bottle neck. Upon comprehensive study, it was found that the hold gang was idle 40% of the time. They spent this time waiting for the hook to deliver the cargo to them. This illustration proves the value of research to management. The opinion of individuals based on experience alone is not enough to base an opinion on. A scientific method of investigation is necessary to find out the actual cause of a problem.

Management must realize that, if the company is to continue profitable operation, research is necessary. Research should be used as a basis on which to formulate management's decisions. It is by no means a substitute for management decisions and should only be used as a guide to assist management in making better informed decisions.

C. Sea-Land Service

1. Utilization of Vessel Capacity

The sea-land service has solved many of management's cargo handling problems by by-passing the conventional break bulk method of cargo handling. The service has added new problems of a different nature, in some instances, which require as much attention by management as the previous problems. The sea-land service was not introduced without making some sacrifices. In order to effectively evaluate the ser-

vice, it is necessary to consider the advantages of the conventional system which were lost to facilitate greater speed of cargo handling.

The major factor that is sacrificed in sea-land service is maximum utilization of the vessel’s cargo carrying capacity. This capacity is measured in two dimensions: one is weight capacity, the other cubic or volume capacity.

The Seatrain Line carries one hundred freight cars per voyage. These freight cars weigh 2,000 tons when empty. Therefore, on every voyage that a seatrain makes it is carrying 2,000 tons of non-revenue cargo. This 2,000 tons represents about 25% of the vessel’s capacity.* If the vessel did not carry the freight cars, it could carry an additional 2,000 tons of revenue cargo. The average revenue tonnage that a seatrain vessel carries per voyage is 4,000 tons.**

The reason the average is not higher is that the cubic capacity and weight capacity of the freight cars prevents the full utilization of its space and weight capacities. The capacity for a seatrain vessel is 8,000 tons. After subtracting the 2,000 tons taken up by the freight cars, the vessel’s revenue cargo weight capacity is 6,000. As the average is lower than the maximum, it means that the system is sacrificing close to 4,000 tons of revenue cargo per voyage.

*14, p. 4.
**2, p. 510.
The utilization of the vessel's cubic capacity is very low. The vessel is designed to carry freight cars, which makes it necessary to sacrifice a great deal of space. Also, the space occupied by the freight cars is lost and, in some cases, the cars themselves are not full. It is estimated that the seatrain vessel sacrifices 25% of its cubic capacity to carry freight cars.

The seatrain has lost much of its revenue potential which is sacrificed to carry freight cars. This disadvantage is offset by the reduced cost of cargo handling and maximum utilization of the vessel. The Seatrain Line is the most profitable operator in the domestic industry.

Pan Atlantic Sea-Land Service provided for a better utilization of the vessel's capacities. The weight of a container is about 2.5 tons, which means that the vessel carries about 600 tons of non-revenue producing weight each voyage. The vessels, prior to being converted, averaged about 5,000 tons of cargo, using the conventional system of loading. If the cargo weight in each container will average 20 tons, then the vessel will be loosing only 600 tons of cargo revenue per voyage. It would seem unlikely that the cargo weight of each container would average 20 tons as, in a previous study that was made, the average cargo weight of a trailer was set at 15 tons. Using this figure then, the loss in weight re-

*14, p.4.
venue would be about 1600 tons per voyage. As in the case of Seatrain Line, this disadvantage is overcome by the reduced cost of cargo handling.

In a roll-on, roll-off operation, the utilization of the vessel's weight capacity would be better than Seatrain Line, as the weight of a trailer is only 5 tons, as compared with the freight car weight of 20 tons. The exact amount of weight loss will not be known until a roll-on, roll-off system is in actual operation. The amount of weight lost will depend on the number of trailers carried. The volume of space lost would be approximately the same as on a seain vessel, 25%. In this case, the lost revenue would be compensated for by reduced cargo handling cost.

2. Flexibility of the Service.

A vessel operating in the domestic shipping industry, using the conventional system of cargo handling is highly flexible as it can take any type of cargo, except liquid, to any port where there is berthing space for it. As in the case of vessel capacity utilization, the Sea-Land Service has sacrificed the high degree of flexibility.

The Seatrain Line can operate only between ports where a special 125 ton crane is available to handle the freight cars. It is impossible to find a crane of this capacity in any ports other than the ones that Seatrain regularly
services. The cranes in these ports were built there by the Seatrain Line.

The Pan Atlantic vessels can operate between any two ports, as no special facilities are needed at the port, other than berthing space at a pier which is accessible to trucks. The only controlling factor of the flexibility of operation is that it must carry the specially designed 35 ft. trailer body.

The proposed roll-on, roll-off system would not have a high degree of flexibility, unless the vessel carried its own ramps. If the vessel did not have portable ramps, it would be dependent upon shore facilities to unload the trailers. This would restrict the vessel's operation, since they could only go between ports equipped with the special ramps necessary to unload the trailers.

At the present time, complete data is not available to enable a comparison of the operating costs of each service. The Maritime Cargo Transportation Conference is presently conducting a study, the purpose of which is to compare operation costs of the three different systems. This information should be very helpful to management of any company in the domestic shipping industry that is planning to depart from the conventional break bulk system of cargo handling.
VIII. CONCLUSION

A. Use of the Conventional System of Cargo Handling

The conventional system of cargo handling is being used at the present time and will continue to be the basic system of cargo handling used by some companies. The continued use of this basic system is insured as many of the companies are unwilling or financially unable to make the drastic change over to one of the types of sea-land service. The efficiency with which the conventional system is utilized will determine the future operation and profitability of the companies employing it.

Management of these companies must make every effort to make improvements in the system whenever and wherever possible. These improvements that management makes will determine the efficiency of their cargo handling operation; which controls, to a great degree, the future successful operation of the company in the domestic shipping industry.

Such improvements as palletizing the cargo, using small containers and installation of unit cranes on the vessel must be investigated by management through research. The advantages and disadvantages of each tentative improvement will have to be investigated by management. Before making a final decision on the improvement, each of these advantages and disadvantages will have to be projected into the future to ascertain their affect on the future operations of
the company. A final decision can be made only after the projections have been made and an evaluation of all future effects of the improvements on the future operations of the company has been formulated. The final decision arrived at by management will have to be defended against any and all attacks or criticisms.

Research has been undertaken which is applying the scientific approach to management's cargo handling problems. From this continued effort on the part of outside agencies, management will become familiar with the critical areas of the conventional cargo handling system. These research programs may provide additional information about the process that has never been uncovered before. This could lead to greater utilization of the system, if they were exploited to the fullest extent by management. Whatever conclusions are arrived at through research, management must apply to the operation in their company if they are to remain competitive with other companies in the industry and competitive forms of land carriers.

The conventional system has proven to be economical in the past and, with improvements and removal of the restrictions placed on its capabilities by labor, would still prove to be an efficient and economical means of cargo handling.
E. Development of Sea-Land Services

The sea-land services that are in operation today have not as yet been developed to the extent that they provide service to all ports in the domestic shipping industry. They service only a small portion of the industry, being restricted to the Atlantic and Gulf Coast trade. The management of these services must expand the scope of their operation; or they will find that other operators have entered their field, which will provide competition to their companies.

The Seatrain Lines, at the present time, is in a position where it must expand its operations or remain in a static position. They have reached a point where their vessels are operating the maximum number of voyages possible per year and carrying the maximum amount of cargo possible. The service, instituted by Pan Atlantic Steamship Corporation, provides a service which is in direct competition with Seatrain Lines' service. The management of Seatrain Lines must increase the areas they service in order to make up for the traffic lost to the newer service. The company, at the present time, plans to institute a 'seamobile' service to the areas they presently service. In this service, two 27 ft. truck trailers will be placed on a railway flatcar and handled in the same manner as the freight cars are handled. *

*27, p. 106.
The management hopes that this will compensate for the competition it is receiving from the Pan Atlantic operation. It is doubtful if this will be enough to allow the company to maintain fully loaded vessels on each voyage.

The Pan Atlantic service has only been in operation for a few months and management has not had the many years of operating experience or the time to expand and develop their service that Seatrain Lines has had. The company's present plan is to expand the service gradually until it is servicing the entire domestic trade of the United States. Before this ultimate goal will be reached, the service must prove itself, not only to the management of the company, but also to the shippers who are to utilize this service. The management of the company will have to proceed with sufficient caution so as not to endanger the financial structure of the company, but with sufficient dispatch to prevent other companies from instituting a similar type of service in the areas that the company has not expanded its service to include.

The proposed roll-on, roll-off, service presents a problem to the management of the two companies presently operating a sea-land service. This system may prove to be better suited to the needs of the trade than the services presently offered. At the present time, there are no plans for any company to commence operation of a roll-on, roll-off service. All of the proposed operations are in the planning
stage and are retarded by the large financial commitment necessary to commence an actual operation. As there is much interest in this type of service, it should not be long before one of the plans will materialize into an actual operation. The management of the present services will have to keep abreast of any developments in the service, as it may prove to be a threat to the success of their own operation.

The management of any company that plans a roll-on, roll-off operation must compare their proposed operation with the two present services. These comparisons should inform management if these proposed operations will be competitive with the others. Unless the roll-on, roll-off operation provides the company with a competitive edge, they should not enter into direct competition with the other services.

Which of these types of service will prove to be most suited to the domestic trade has not been proven yet. There may be enough basic advantages in each system to allow all three to exist simultaneously, each enjoying equal success. In all probability, at least one of the systems will be restricted in the expansion of its business by the remaining two. It is not altogether inconceivable that one of the systems will have such inherent efficiency of operation that it will displace both of the other types of service.

It is the opinion of the writer that the Pan Atlantic service has a definite advantage over the Seatrain's
service. This is due to the better utilization of the vessels' capabilities and flexibility gained by not requiring special port facilities, which is hindrance to the expansion of the seatrain service. The seatrain system has proved profitable in the past, but its profitability will be dependent on its ability to compete with a service which is believed to hold the competitive edge.

C. Future Cargo Handling Problems of Management

No matter which system of cargo handling the companies' management operates, labor-management relations will present future problems. The seriousness of these problems to management's operation in the sea-land service is less than to those using the conventional systems. If management allows labor to place restrictions which affects the efficiency of the sea-land service through continued poor labor relations, then their problems will be as acute as those operating the conventional system.

As long as management continues to conduct collective bargaining with the union representatives through an association of shipowners, improvement of labor relations will not take place. The association's membership is not homogeneous in nature as different companies have different problems. Also, the directors of the association have no connection with the industry and are, in a sense, a third party. Management must do its own collective bargaining if labor relations are to improve.
Now that research projects have been undertaken that will show management the areas of the system that can be improved, management must decide which of these areas it will undertake to investigate. They will also have to spend money on the projects. The amount of money to spend on research and the control of research presents problems that some of the management in this industry has never met before. These problems are very difficult to solve so that all factions are balanced. Management, in some more advanced industries, are still having trouble solving the problem of research expense and control of the project.

Management engaged in the sea-land service must keep abreast of all developments in this area as, it is not inconceivable that someone will put into operation a system that utilizes a vessel's capacity to a greater extent. This system would have great advantage over the others if it could provide the same speed and low cost of cargo handling.

D. Future of the Domestic Shipping Industry.

The opinions expressed by the industry's management as to the future of the domestic shipping industry varies considerably. One opinion is that there is no future for the companies engaged in this trade. This is borne out by the fact that the management of a number of companies, formerly operating in the trade, have ceased domestic operations. Others express the opinion that the sea-land service in
operation and those which are proposed will provide these companies with a bright and prosperous future. They foresee the day when all the general dry cargo will be carried by vessels which utilize one of the sea-land systems.

The opinion of the author is that the conventional system will be used until sometime in the near future when it will be replaced by some type of sea-land service. Which type of service this will be is not evident at this time; but the consensus of opinion is that a roll-on, roll-off system will prove to be the most efficient. The management of the Pan Atlantic Company feels that their system will eventually be the one that replaces the conventional break bulk system. Some special commodities will continue to move in vessels that do not use the sea-land type of service, but the general dry cargo will be carried by the new type service.

The extent to which the new type of cargo handling systems will be able to increase the tonnage carried in the domestic trade will depend on the ability of management to sell the system to shippers. The amount of cargo transported via the new systems will depend on the action of government regulatory authorities and the competition of land carriers.
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