Intermodal Movement of Marine Containers

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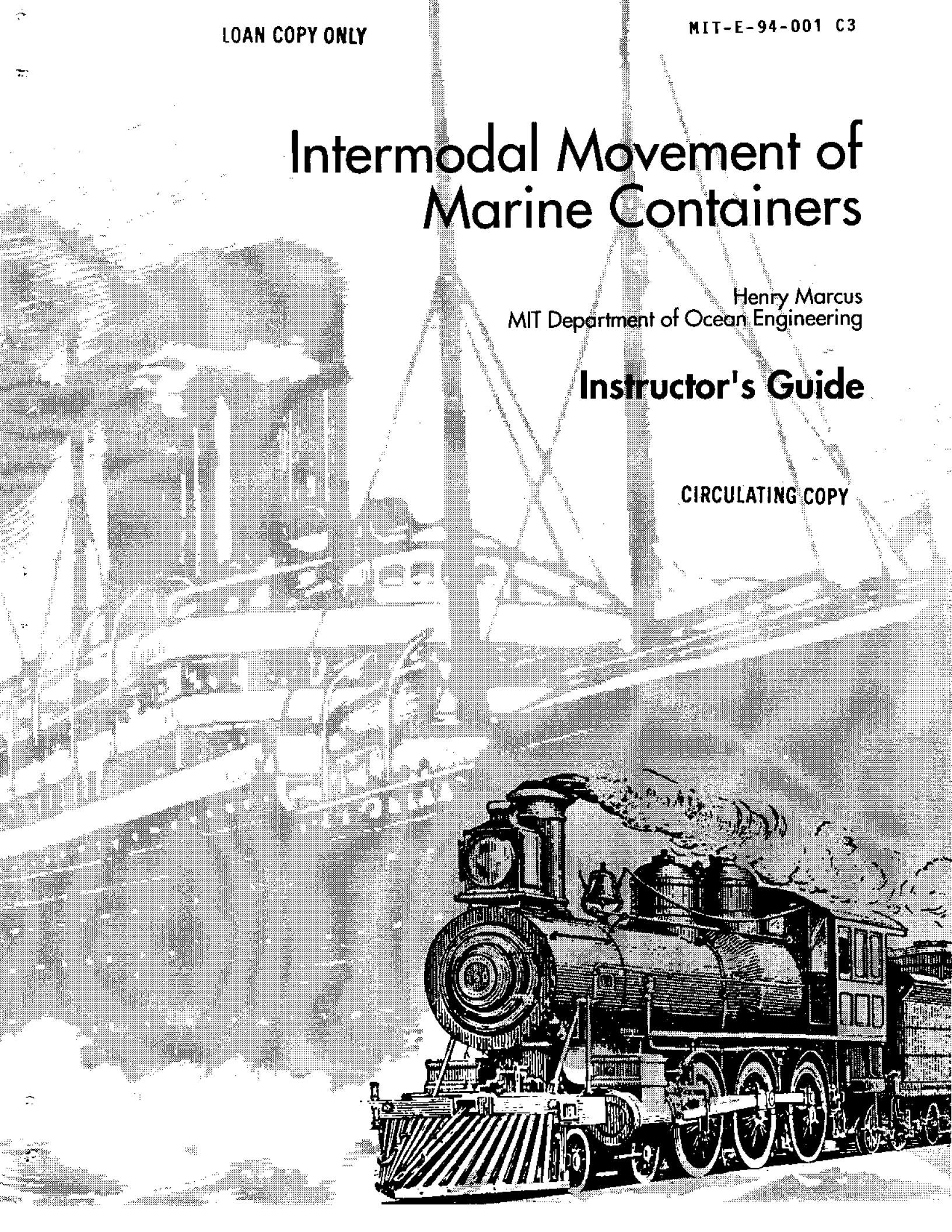
Instructor's Guide



TEACHING NOTES

FOR

INTERMODAL MOVEMENT OF MARINE CONTAINERS

BY

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PREFACE

Many persons aided the writing of this Instructor's Guide. In most instances, the people that helped to write the case studies contributed to the teaching note for that case study. For all case studies the students that struggled with them in class provided valuable input to the teaching notes.

Professors Tom Dowd and Neil Gallagher were kind enough to review parts of this document for me. I also want to thank Marcia Munger for her skill, typing and patience.

8-13-93

CHAPTER 1
Introduction
Teaching Notes

TEACHING NOTE

The purpose of this chapter is to present to the instructor of a course related to transportation or logistics management an overview of how this book can best be used. Other chapters in this manual relate directly to the chapter of the same number in the book.

It is assumed that students using this book have an elementary background in transportation, engineering economics, and management. They should know what the different types of ships are (e.g., containership, roll-on/roll-off) and a little about their operations. The students should also understand discounted cash flows and net present value. It is also assumed that they know how to read a financial statement and can perform elementary financial ratio analysis (e.g., debt/equity ratio, profit/revenue). If these assumptions are not correct, the instructor must teach these topics as early as possible during the term.

This book can be easily used to teach about eleven 1.5 hour sessions. The eleven value assumes one session per chapter, although the instructor may wish to spend more time on a particular case study. With more sessions, the instructor may want to add the following types of material: the prerequisite material described above, a general discussion of key factors in decision making (e.g., timing, financing, government subsidies and regulations), current events in the transportation industry, methodologies for corporate strategic planning, or tax laws and government regulations as they affect transportation.

Each chapter in the book is self-standing so that the instructor does not have to teach any of the preceding chapters in order to use a particular case study (although it would be helpful to teach the Burlington Northern (A) case, if the instructor wished to use the (B) case). It is generally recommended that the general order of the chapters in the book be maintained in the teaching sequence.

If the instructor wishes to spend class time on Chapter 1 of the book, he or she could discuss the material in this chapter as well as the types of general information mentioned above.

Chapters 2 through 11 deal with a large number of different topics. Various technologies are used by the parties mentioned. One common thread through the case studies is how the parties did (or did not) use the double stack (DS) train technology in their operations. In order to put the DS technology into perspective, it is helpful to think of a general framework that sets out the chronological events and the industries involved, as shown in Table 1. The way in which the framework was filled out is explained later in this chapter.

GENERAL FRAMEWORK FOR DEVELOPING CASE STUDIES

TABLE 1

Time Scale \ Different Time Scale	Industry A	Industry B	Industry C
Before Introduction of New Technology			
During Introduction Period			
After General Acceptance			

THE DOUBLE-STACK CONTAINER TRAIN

In the late 1970s carriers experimented with the idea of carrying marine containers two high on railcars. In 1984 American President Lines (APL) a major ocean carrier in the Pacific Basic, introduced a major double stack (DS) train service from U.S. West Coast ports, resulting in the eventual general acceptance of this technology.

For the past fifteen years the container trade from the Far East to the U.S. has exhibited impressive growth rates. Ocean carriers could either move their ships through the Panama Canal to reach destinations on the U.S. East and Gulf Coasts or unload at West Coast ports and typically proceed by rail to port terminals on the other coasts.

The DS trains implemented in regular service were specially-designed light-weight vehicles. The DS container train almost halved the line-haul costs of moving containers by rail. APL, which served only the West Coast of the U.S. could effectively extend its hinterland with the use of this new technology.

CHOICE OF CASE STUDIES

Case studies allow the student to play the role of management in different settings. The parties chosen for case studies were in the three following industries: port authorities, ocean carriers, and railroads. Each entity could conceivably own DS rail cars. As the case studies show, each organization had to decide whether to embrace the new technology or avoid it.

The case studies are focused on three time periods: before 1984, when the technology was still experimental; fall 1984 and 1985, when the initial introduction of the technology was taking place; and 1986 and later, after the acceptance of the technology when parties were trying to improve their competitive position. Table 2 shows how the earlier diagram was filled out. Emphasis was placed on the time periods after routine DS train service was introduced. Table 3 provides additional information on the ten case studies in a chronological order.

APPLYING THE FRAMEWORK TO DS CONTAINER TRAINS

TABLE 2

Time Scale \ Different Industries Affected	Ports	Ocean Carriers	Railroads
1983 Before Routine DS Train Service	Long Beach		
1984 & 1985 Introductory Period	Boston, New York & New Jersey	American Automar	Burlington Northern Railroad (A)
1986 & 1987 After General Acceptance	Seattle, New Orleans	American President Companies, Cast	Burlington Northern Railroad (B)

OVERVIEW OF CASE STUDIES

TABLE 3

Date & Relationship to New Technology	Name of Case Study	A Key Feature of the Case Study
1983 Experimental Stage for Technology	Port of Long Beach	A new container terminal is needed to handle rising Far East imports
Fall 1984 & 1985 During the introduction of new technology; reaction of different parties	Burlington Northern Railroad(A)	A new DS train container terminal presents the opportunity for a new labor agreement.
	American Automar	An ocean carrier can choose a strategy that avoids the use of the new technology.
	Port of Boston	DS trains could result in less cargo through the Port of Boston.
	Port of New York and New Jersey	As a major port, PONY & NJ could not ignore the new technology.
1986 & later After acceptance of technology; attempt to improve competitive position	Burlington Northern Railroad (B)	Labor agreement at a new terminal cannot necessarily be transferred to an older facility in a different competitive environment

OVERVIEW OF CASE STUDIES

TABLE 3 (cont.)

Date & Relationship to New Technology	Name of Case Study	A Key Feature of the Case Study
	Port of Seattle	An on-dock facility for DS trains will have public relations benefits but may not be worth the cost
	Port of New Orleans	DS trains aided ports on the West Coast but penalized those in the Gulf of Mexico.
	Cast (1983) Ltd.	Using only the Port of Montreal in North America, Cast must compete without DS trains

Four ports are chosen to provide a contrast as to how DS trains affected different coasts of the U.S. Since these port authorities are all quasi-government bodies, they all face a public policy role in their activities. Since the driving force for DS trains was the rising imports from the Far East, West Coast ports saw the opportunity to divert cargo from the all-water route through the Panama Canal. Long Beach in 1983 faced quite different challenges than Seattle in 1987, but they both succeeded in increasing their cargo volume.

On the East Coast, the introduction of DS trains was initially a threat as it diverted cargo from all-water services from the Far East. The Port of New York and New Jersey, a major U.S. port, as well as the Port of Boston, a smaller U.S. port, eventually received some benefits from DS trains. Aggressive marketing of the empty westbound backhaul movement of the DS trains encouraged U.S. trade with European and Mediterranean areas to pass through East Coast ports served by this technology. In contrast, ports on the Gulf Coast, such as the Port of New Orleans, were consistently hurt by the new technology (along with the initial loss of cargo being diverted through West Coast ports). In a stagnant business environment for U.S. trade with Central and South America, DS trains

focused on international cargo moving in either a transpacific or transatlantic trade. In the case of New Orleans, the ocean carriers saw DS trains as an opportunity to replace port calls to the Gulf Coast with rail movements from East or West Coast port calls.

From the perspective of ocean carriers, DS trains presented a threat or an opportunity. American President Companies (APC), the parent of APL, took advantage of the opportunity to provide a totally integrated transportation system with huge containerships, modern terminals, DS railcars, a worldwide computer network and logistical management services. American Automar, without APC's financial or managerial resources, chose a ship design (i.e., roll-on roll-off) and corporate strategy that avoided the need for using a DS service. Cast, using only the Port of Montreal in North America, did not have an opportunity to use DS trains (at the time of the case study).

Railroads faced a range of issues including whether to compete or cooperate with the ocean carriers in the ownership of DS rail cars. Burlington Northern Railroad (BN) was one of the more aggressive railroads in introducing DS train service. The two sequential BN case studies focus on labor relation issues with the new technology. The need to build a new facility created an opportunity to improve labor agreements. However, the success at this new terminal could not be readily transferred to an established older facility.

TEACHING CHALLENGE

One challenge for the instructor is to manage to bring the students back to the common thread of the introduction of new technology throughout the teaching of the case studies. While focusing each class on the particular circumstances of the specific case study, the instructor must be able to bring out in the class discussion the similarities and contrasts with the case studies taught earlier. The teacher must show how the same technology poses different threats and opportunities to the different parties involved. In addition, competitive positions of the parties change over time as the new technology moves from the experimental stages to introduction to general acceptance.

10-27-92

CHAPTER 2
The Port of Long Beach
Teaching Notes

TEACHING OBJECTIVES

As the first case study in the book, this case study sets a positive tone with a net revenue-generating (i.e., profitable) entity that is looking at expansion for the future.

In analyzing the case study, the student should:

1. Get an appreciation of how difficult it is to predict 20 to 50 years into the future.

2. Identify the players involved in the investment process.

3. Evaluate the type of risks involved for each of the players.

TEACHING FORMAT

The instructor might use this first case study to bring out many of the general issues involved in port development. Typical questions to the class could be: What are the most important factors in deciding on the Intermodal Container Transfer Facility (ICTF) investment?, or What issues face the Port of Long Beach (LB)?, or What are the characteristics of the Port of LB?

The ensuing discussion should bring up a number of factors from the case study: the high growth rate for container traffic in general through the port, the high growth rate of minibridge traffic through the port, the ability of the port to be profitable (a net revenue producer), competitive position versus Los Angeles and other West Coast ports, the amount of work involved in developing a new facility (nine inches of material), the need to commit to 20 years of bond payments (and a 50 year agreement with Los Angeles) and the environmental concerns involved.

A few simple calculations show the difficulty of making predictions for 20 year hence. Using the rule of thumb that an annual interest rate divided into 72 will give you the number of years to double (e.g., at 8% growth per year, volume will double in 9 years), a 12% growth rate for 20 years will result in volume

growing by a factor of more than 8 while 6% growth rate will result in a factor less than 4. How does a port make investments under such uncertainty? (One way is to have a 4-phased investment plan as proposed.) The kinds of factors that have aided the Port of Long Beach include a deep draft harbor, past oil revenues, the generally high traffic growth rate of the transpacific, and the emergence of minibridge (caused in part by the Oil Embargo of 1973). In addition, there is the future hope of double-stack trains. One might speculate as to the U.S. and global factors that could affect the port in the future.

The consultants estimated that container traffic through the port in the year 2000 would be 5 times the 1981 figure. (One might consider the traffic problems of moving an average of 2,259 containers per day to or from the port; if the peak is more than twice this value, congestion and air pollution could be significant.) From a strategic viewpoint, it is important for the port to expand to keep pace with traffic growth and to maintain a dominant position in minibridge traffic. The amount of money for this investment, $9 mil. for rail access and $31 mil. for Phase I site improvements (plus land rental), doesn't seem too bad for a port considering a $550 mil World Trade Center and sharing risks with the Port of Los Angeles (LA).

Although the port looked at hundreds of pages of computer output, there are two issues that were glossed over. First, the cost of the truck movement to the ICTF is more directly related to time than distance. What will happen to travel time as traffic grows? Second, if the port really believes these traffic forecasts why don't they develop the ICTF as an on-dock facility and eliminate all that truck traffic? The case study implies that land doesn't exist for such a venture, but wouldn't it at the right price?

A discussion of who the players are and what risks they are taking is worthwhile. The players (or parties affected) include: ports (on both the West and East Coast), shippers, ocean carriers, railroads, trucks, facilities replaced and surrounding neighborhoods. SP is freeing up prime downtown property, so there is little risk for them. Everyone using the port should get a better level of service (if it is operated properly; of course, there are always the existing alternatives if they are better). The Port of LB has little risk. As long as the port continued to grow the ICTF would eventually fulfill its Phase I expectations (although possibly without the amount of profit anticipated). A concern for LA was whether there was a better use for the ICTF site. If it really was as unique as implied by the case study, other uses should be considered (and the ports should jump at the chance to get it while its available). From an environmental perspective, there are some concerns even after the construction is completed. The growth rate predicted will bring huge amounts to truck traffic, noise and air pollution. While putting containers on trains 4 miles from the port will help, the traffic in the port area will be significant.

WHAT HAPPENED

The ports went ahead with the ICTF as described. From a financial viewpoint it was a success. Transpacific cargo and minibridge traffic continued to grow. Double-stack trains aided this process. The ICTF reached its Phase I expectations ahead of schedule but did not expand. It was becoming clear that both LB and LA had land-side access problems. A Project 2020 joint venture of the two ports planned the spending of several billions of dollars by the year 2020. The money would be used to create thousands of acres of more land from dredging as well as building a variety of facilities. A key element would be the creation of a consolidated corridor away from the ports carrying both rail and truck traffic. Union Pacific Railroad was already providing service to a small on-dock rail facility; this corridor would allow for much greater use of on-dock rail facilities. However, SP owned the key rail line needed and wanted more to sell it than the ports were willing to pay. By 1992 the situation had still not been resolved.

8-11-93

CHAPTER 3
Burlington Northern Railroad Company (A)
Teaching Notes

TEACHING OBJECTIVES

As Burlington Northern Railroad (BN) plans to open a new intermodal facility to move a new type of cargo (i.e., double-stack container trains), the opportunity of a labor-management relations breakthrough presents itself.

In analyzing the case study, the student should:

1. Identify the key players involved in the process of choosing the workforce for the new SIG facility.

2. Determine the opportunities and risks involved for each of the players.

3. Evaluate what type of labor-management agreement is reasonable.

4. Place the SIG decision in perspective as part of the overall BN strategy and operations.

TEACHING FORMAT

This case study lends itself well to role playing. The instructor may want to first have a general discussion of who the key players are: (1) BN, (2) IMS (or other third party facility operators), and (3) labor (possibly BRAC, ILWU, teamsters or non-union). It might be useful to have the students place the SIG decision in perspective as far as its impact on the BN annual report. With more than $9 billion in revenue ($4.5 bil. from rail) and $1.4 billion in profits ($1 bil. from rail), the decision on 20 persons in the new facility will not be seen on the profit and loss statement.

On the other hand, the stack train business appears to have great potential. An efficient operation at SIG would be a great help to future market opportunities. However, a labor-management disaster might have negative ripple effects through other parts of the BN system. Consequently, use of non-union labor appears to be a very high risk strategy. Use of BRAC would solve some problems in that ILWU and the teamsters wouldn't have much to complain about.

I like to divide the class into three groups (1) BN, (2) IMS and (3) BRAC. If you can organize this ahead of time, each group might have a homework assignment to determine what its major bargaining points would be and what it deemed as essential to get out of negotiations.

The following items appeared to be important to each of the players:

Workers (BRAC)

At an average age of 30, these people looked forward to a life in a large room with nothing to do (called the "rubber room" by some). As long as 20 out of the 300 BRAC workers were willing to take a cut in pay, the system could work. Of course, a bonus or "buy out" payment to change to the new facility would be helpful. The union, naturally wanted to represent all the workers at the new facility.

As workers in a labor surplus area, the practice of "bumping" could be frustrating. The new job wouldn't have that problem. The workers would want seniority over workers hired later, health benefits and protection from being laid off/fired.

IMS

The key factor for IMS was flexibility. Stack trains were a growing market. As long as the wage/benefit package was reasonable (in the eyes of BN), the flexibility in using all workers for all jobs at all appropriate times (without overtime for 40 hours per week) was critical (since the workers were needed when the trains arrived -- whenever that might be).

BN

BN needed a solution that would not cause problems in the rest of its system and might even establish a precedent for innovation elsewhere on the railroad. It was important that any solution get the workers off the guaranteed employment rolls that the BRAC workers had at BN. Since the stack train market was growing with plenty of competition, there was a need to have an efficient

operation. While cost was important, the ability to have the trains meet the ships in a reliable and efficient manner was more important.

CLASSROOM NEGOTIATIONS

The instructor could try to facilitate negotiations among the 3 groups in the classroom. The key purpose is to get the relevant factors up on the blackboard and prioritize any unresolved issues. If the issues cannot be resolved, at least the class can establish how far apart the sides are.

WHAT HAPPENED

The 3 parties came to terms as explained on the first page of the BN (B) case study (page 146). By using the recognized union, BN did not have problems with the ILWU or the teamsters, (as well as BRAC). The BRAC workers were willing to take the cut in pay described in the (A) case study and were willing to work with flexible work roles and hours. In return, they received a bonus of one year's pay and the satisfaction that they would have important jobs in a growing market rather than facing life in the "rubber room." (Persons might argue that the relatively young age of the workforce facilitated such an agreement.) BRAC got to represent all the workers in the facility. A trial period was established during which the workers could go back to their old jobs if they didn't like the new ones (but without keeping their bonuses). Also, if IMS were to go bankrupt, they could also get their old jobs back.

The BN got these workers off the guaranteed life time rolls and IMS got an efficient operation. When I visited the operations I was impressed with the high morale, high job satisfaction and efficiency.

8/16/93

CHAPTER 4
American Automar Inc.
Teaching Notes

TEACHING OBJECTIVES

This case study shows the students how a group of enterpreneurs, using basically other people's money, can identify a market niche and enter the shipping business moving military Ro-Ro cargos in combination with commercial containers and Ro-Ro cargos. This third tier carrier provides a dramatic contrast to a first tier liner operator like American President Companies, that must deal with double-stack container trains and elaborate information systems.

In analyzing the case study the student should:

1. Understand what a group of entrepreneurs must encounter in starting up a new business with little of their own capital.

2. Identify the risks involved, including all financial and competitive aspects.

3. Understand the organizational structure, management skills, amount of management resources, and contractual relationships/strategic alliances with others that are involved in such a venture.

4. Realize the importance of timing in all these activities.

5. Be able to differentiate in the above analysis the difference between factors unique to the company versus the shipping industry versus the general global market place.

TEACHING FORMAT

I like to get all the key factors on the blackboard in such a way that the students understand where the company can -- and cannot -- have some degree of control. One might start with a general question such as "Please describe an issue that you feel was important in this case study?" As the instructor, you might visualize three columns in the blackboard with the three following headings:

(1) Overall National/Global Issues, (2) Overall Shipping Industry Issues, and (3) Specific Company -- American Automar (AA) -- Issues. If you wish, you might simply place the factors identified by students in the appropriate column -- without placing the headings on the columns. Once the board is filled up you can write the headings -- or ask the students to come up with the headings.

The types of topics that will appear in the three columns are described below.

(1) Overall Global/National Issues

- World Politics -- will there be major wars or regional conflicts?
- Military Strategies -- what types of cargo and how much will be moved?
- Military Procurement Policies -- will the U.S. government own cargo ships? long term charter? use space on liner vessels?
- World Economics -- what economic growth rates will exist? What will be the impact on the type & amount of commercial cargo? Which trade routes will benefit?
- Trade Balance/Imbalance -- where and to what extent?
- World Interest Rates -- in which direction will floating interest rates go?
- World Energy Policies -- how will the price of ship bunkers be affected?

(2) Shipping Industry

- Current depression -- will it last?
- Supply/demand on AA's trade routes -- will freight levels rise or fall? What will be the direction and extent of trade imbalance?
- Future of ACL -- will they acquire additional vessel capacity? will they exploit AA in fees for documentation, stevedoring, etc.? Impact of AA joint venture on ACL vs. AA?
- Competition for U.S. military cargo -- will larger companies underbid AA? what if AA doesn't win its first bid? what if others copy a successful AA strategy (how much of a head start does AA have)?
- Military policies -- what if the military drags its feet in taking cargo out of its own vessels to put in commercial ships? What if the military doesn't acknowledge the cargo handling savings with ro-ro versus putting cars in containers (since there is probably no cash transfer involved for this latter operation)?

(3) Company-Specific Issues

- Ship Conversion -- what could go wrong in terms of cost, timing, USCG approvals?
- Mixing commercial & military cargos -- what are the possible problems with scheduling, desired port calls, loading/unloading, cleaning the ship?
- Mechanical operation of ship -- what if there are mechanical problems?
- Entrepreneurial Adventure -- would this venture have been possible without a unique combination of skills in the founders: management, chartering, vessel brokerage, operations, government relations, joint ventures, law, finance (Note: these are professionals; students should not try this at home!!!).

- Accuracy of proforma – how does sensitivity analysis (e.g., rate per unit, number of units) affect the financial outcome? how much can the company finders lose? under what conditions can the seller reclaim the ship?

- Limited management resources – does AA have enough management resources to do it all? How much management time will be involved dealing with commercial cargo (e.g., port calls, cargo claims)? What if one executive is hit by a bus?

RESULTS OF ANALYSIS

There are a number of general conclusions.

- The depressed shipping market means that AA can start a company and buy a first ship worth about $33 million ship while putting up less than $110,000; now after one year and a $908,000 profit, they can control another $30 million asset. (Of course, the founders posses an impressive set of backgrounds). Although not explained in the case study, Zenit was charging much more than the market price to make it worthwhile for it.

- The three year financial performa is rather insensitive to small amounts of variations in the inputs. With a predicted profit of $16.4 million per year, you can pay off everyone with money to spare in 4 years. Even a considerably worse profit record would enable AA to refinance.

- There are a huge number of potential risks and they are almost all outside the control of AA.

- Hauling military cargo under contract is a dramatically different business than running a commercial liner service. As a commercial liner operator, AA is a very small fish in a very big pond.

WHAT HAPPENED

AA bought the KESTRAL, won the military bid and the first year went even better than the proforma. Then life got more complicated. ACL got more ships and reduced the amount of cargo it gave to AA (and eventually the backhaul direction reversed). ACL took advantage of its bargaining strength with AA. AA decided to look elsewhere.

AA worked out a joint venture liner service with Crowley (AmTrans). As part of this arrangement, AA purchased a third ship from Zenit to permit bi-weekly sailings. (But now AA was dependent on Crowley for liner service administration.)

Another company (Fed Nav) followed AA's success with the initial military contract by buying two old ro-ro's, converting them to U.S.-flag, and competing. In one year the military rates dropped 50%. The military was slow to acknowledge cargo handling savings with ro-ro versus putting cars into containers and also slow to shift cargo from its chartered ships to commercial liners.

AA sold its second and third ships to Crowley and came out with a profit. (The first ship was still on charter to MSC.)

Although tax issues are not discussed in the case study, the Tax Reform Act of 1986 had a strong negative effect on AA's investments. Before the 1986 Act, AA could take advantage of Investment Tax Credit (ITC), short depreciation life, and accelerated depreciation schedules (as reflected in their low tax payments in the Pro Forma Income Statement). The 1986 Act eliminated ITC and extended the ship depreciation life.

CHAPTER 5
The Port of Boston
Teaching Notes

TEACHING OBJECTIVES

This case study allows the student to look at the impact of a new rail technology on a port, where the introduction of double-stack container trains to Boston might actually decrease the container flow over the docks. Only two years have passed since the Port of Long Beach decided to build its Intermodal Container Transfer Facility, but the double-stack train concept appears to be thoroughly accepted in 1985. Its use through West Coast ports raises the question as to what should be done at East Coast ports and by whom. The size of the Port of Boston relative to the Port of Long Beach (or New York and New Jersey) also raises an issue.

In analyzing the Port of Boston case study, the student should:

1. Consider what the purpose and goals of the Port of Boston are or should be.

2. Consider how far inland from the waterfront Massport's influence/ jurisdiction extends -- and who takes over from there.

3. Evaluate how the introduction of double-stack trains will affect cargo movement through the Port of Boston.

4. Analyze the impact of doing nothing (as well as other alternatives).

TEACHING FORMAT

I suggest the instructor start by asking either, "What should Massport do relative to double-stack trains?" or "What objectives and goals should Massport have in the justification of its existence?" Regardless of which question the instructor starts with, the purpose of the overall discussion should be to look for consistency between the objectives and the actions.

The overall objectives should deal with such topics as: helping to maintain and attract the local businesses by providing efficient transportation through the port, providing jobs on the waterfront and off, and generally serving the public interest. The actions, consistent with these objectives, relative to double-stack trains are not clear cut.

The instructor may want to contrast this case study with Chapter 2, The Port of Long Beach. The West Coast port wanted expanded port facilities to handle the growing eastbound trade from the Far East. The use of double-stack trains was consistent with increasing cargo volume through the port. More cargo would mean more jobs and hopefully higher efficiency (as well as more noise and air pollution, unfortunately). The Port of Boston faces a more difficult challenge. Because the incentive for double-stack trains is to move Far East cargo eastbound across the U.S., an efficient double-stack service to Boston would actually decrease the amount of all-water service from the Far East moving through the port. (In theory, a double-stack train service to Boston could increase westbound cargo moving through the port, but the dominant flow of marine containers on double-stack trains was definitely eastbound.) This dilemma is quite unusual for a port in that it might have to trade-off jobs in the port for jobs in the local industries that would gain by more efficient transportation to and from the Far East.

Another fundamental issue is, Who is in charge here? Who should be taking on the role of coordinating the introduction of double-stack trains? Is it Massport, the railroads, the State Department of Transportation, or some other body? Once you move inland from the waterfront, the jurisdiction or influence of the port authority greatly decreases.

Another consideration is port volume. As shown in the exhibits, container volume through Boston is about one-eighth of Long Beach (and approximately one-twentieth that of the Port of New York and New Jersey, described in the next chapter). As a relatively small port, Massport can not be expected to lead a major investment activity away from the waterfront. Similarly, the impact of the port is mostly at the local level; it does not serve a regional or national hinterland in a way that New York or Long Beach does. In addition, the Port of Boston container traffic moves to and from the harbor mostly by truck.

WHAT HAPPENED

In the mid-1980s there was much talk about double-stack trains in the Boston area, but no one took any action. Later Sea-Land (under a Vessel Sharing Agreement with other carriers) started bringing its huge Atlantic Class containerships (about 4456 TEU) into Boston. Private interests developed double-stack terminals in Worcester and Palmer, Mass, approximately 40 miles west of Boston. The containers would be trucked to these terminals where they would be loaded onto double-stack trains for a westbound movement. Some Far East containers made use of this double-stack service to reach Boston, but overall this double-stack service had little effect on the already declining all water service from the Far East to the Boston area.

10-9-92

CHAPTER 6
The Port of New York and New Jersey
Teaching Notes

TEACHING OBJECTIVES

This case study allows the student to look at the introduction of double-stack container trains as viewed in the Port of New York and New Jersey (PONY/NJ), by far the single largest containerport in the U.S. in 1985. This case study provides a contrast with both the Port of Long Beach (Chapter 2) and the Port of Boston (Chapter 5).

In analyzing the PONY/NJ case study, the student should:

1. Understand the characteristics of a major "load center" containerport.
2. Identify the trends affecting the PONY/NJ in 1985.
3. Consider the role of a public port authority in potentially competing with a private company.
4. Evaluate the options open to the port in reacting to the introduction of double-stack trains.

TEACHING FORMAT

The instructor may start with the "big picture issues", such as "What are the characteristics of a major load center port?" and "What trends are affecting the PONY/NJ?". This discussion should lead to the conclusion that, unlike Boston, the PONY/NJ cannot ignore the double-stack trains.

A discussion of the characteristics of a load center port will bring out much of the information in the case study: cargo volumes, "deep" water channel, modern terminals, skilled (though expensive) work force, access to truck and rail transportation, and infrastructure services. The case study states the need for a "port load center management entity." The instructor might ask the students if they agree with this assessment. If the students agree, then is this entity the port authority and what is the role of this management entity relative to double-stack trains?

A discussion of trends will bring up the contrasts between absolute values (e.g., population, cargo movement) and percentage rate of change. The PONY/NJ serves a major local population with a high level of income and

business activity. However, when one looks at rate of growth, the relative market position of the PONY/NJ is declining relative to some other parts of the country.

The port's market share of U.S.-Asia waterborne trade, particularly for high value cargo, has decreased over time. The use of double-stack trains will not help this trend. However, the port's role as a major center of population and business activity will help in the area of domestic containerization and double-stack trains could be used to carry both domestic and international cargo.

As part of a major business center that handles huge amounts of domestic and international cargo, the PONY/NJ cannot ignore double-stack trains. To maintain its status as a "full-service" load center it needs to use the most modern technology. The instructor can ask the students to vote on the alternative strategy they like best as described in the case study, ranging from #1 Oppose to #5 Strong Support. Although it's difficult to estimate the benefits involved with these options, certainly the costs involved for even the most expensive is small based on the financial resources of the port. One underlying issue in the discussion becomes the role of a public port authority competing with private firms. Should a port authority own rail cars and establish a local trucking operation or should it leave such activities to the private sector?

WHAT HAPPENED

The response of the PONY/NJ most closely resembled option #4 Medium Support. The port did not directly acquire equipment or establish a local trucking operation. Instead it largely ran a public relations/advertising campaign in conjunction with a freight forwarder to attract cargo for double-stack train service. In this way the port tried to help small companies get double-stack train service without directly investing in the equipment. This activity promoted by the port had limited success. Criticisms included: the port made a half-hearted effort and didn't put enough resources into it as well as the freight forwarder was the wrong one and was picked in the wrong way. Eventually, the private sector made the investment necessary to provide lots of double stack service to the port region.

8-13-93

CHAPTER 7
Burlington Northern Railroad Company (B)
Teaching Notes

TEACHING OBJECTIVES

This case study is the sequel to the Burlington Northern Railroad Company (BN) "A" case study (Chapter 3). By the time of the (B) case study SIG had become a great success. The BN goal was to repeat that success at the Chicago Hub Center at Cicero.

In analyzing the case study, the student should:

1. Determine the pro's and con's as well as the risks of the various options.

2. Compare the circumstances in Cicero with the situation at SIG.

3. Plan a course of action for BN.

TYPOGRAPHICAL ERRORS

Please alert the class before hand of the following typographical errors in the case study.

On page 148, in the table at the top of the page, the title "contractor option" should apply to columns 2-4 (i.e., the first 3 columns of numbers); the title "BRAC Option" should apply to the last column.

On page 150, the third row under "Year/Level" should read, "3) Outside contractor 13; 0; 23; 233; 233; 269".

On page 151, the second line of the title at the top of the page should read, "BN Exempts".

TEACHING FORMAT

The instructor might start by asking for descriptions of each of BN's options: status quo, a BN-controlled composite work force and an outside contractor-controlled work force. The case study doesn't explain how efficiently the status quo is working. However, given the assumption that the new options could eventually reduce the work force from 272 to 243 persons, these 29 redundant persons are caused by the lack of flexibility that exists at SIG.

The instructor may want to walk through the analysis in the appendix in order to have the class better understand the new options. In each option there are a number of key assumptions (and potential risks), such as:

- constant business volume
- reduction of 10 employees in year one; 14 in year two; and 12 in year three because of the "composite workforce"
- new positions will be filled with competent persons
- assumptions as to existing people to be retained with new employer are accurate
- BRAC will go along with two-tier system of "new" and "old" BRAC wages and fringe benefits
- assumptions about BRAC people at Cicero taking buyout and transfer pay are accurate
- contractor will split cost savings 50-50 with BN (and that cost savings will occur)
- hostling tractors can be purchased and delivered without problem
- the transition will go smoothly

Once the instructor goes through all the potential problems, he/she can ask the downside risk if things don't go as planned. Since Cicero handled the largest volume in the BN system, problems here have a major impact.

Next, the instructor can ask about the potential benefits of these options. Note that with a discount rate of only 6%, the only option with a minor positive net present value (NPV) is the contractor option with 15% buyouts. If the number of buyouts is less or the discount rate is raised beyond 6.1%, the NPV will be negative. In conclusion, there are plenty of potential risks but very little potential benefits (e.g., why should BN settle for a discount rate of 6%?).

At this point, the issue appears to be why could BN do great things at SIG but not at Cicero. The table below compares the situation.

Comparison of Circumstances: SIG versus Cicero

Characteristic	SIG	Cicero
Size of operation	very small	very large
Age of facility	new	old
Worker situation	surplus	can't fill openings
Bumping of workers	key problem	no problem

The table shows that situations were quite different at SIG and Cicero. At SIG could be innovative at a small new facility with a workforce that wanted change. At Cicero there was a huge operation where BN could not fill the openings.

WHAT HAPPENED

BN came to the conclusion that to effect change at Cicero would require a structural change in labor-management relations. Consequently, their short term response was to retain the status quo at Cicero. However, BN began a longer term strategy to bring about a structural change in its labor management relations (and eventually gained some improvement over time).

10-17-92

CHAPTER 8
American President Companies, Ltd.
Teaching Notes

TEACHING OBJECTIVES

This case study allows the student to see the issues involved in designing new ships both on the strategic level as well as on the operational level.

In analyzing the APL case study, the student should:

1. Understand the interrelationship between corporate strategy and ship design.

2. Consider the trade-offs in vessel design between premium service and lower cost.

3. Understand the costs and benefits of introducing new technology in ship design.

TEACHING FORMAT

I suggest the instructor ask the students to vote on the four possible combinations: 6 "slow" Panamax ships, 6 "slow" non-Panamax ships, 5 "fast" Panamax ships, and 5 "fast" non-Panamax ships. The student explanations of 5 versus 6 should emphasize either premium service or lower cost. The explanation of the choice between Panamax and non-Panamax should emphasize either the risk of new technology or the potential benefits.

According to the case study, APL's "most important strategy priority is improving margins." Note that between 1984 and 1986, revenues grew at a lower rate than "Operating Expenses" or "General and Administrative" expenses. This objective can be met by either raising revenues or lowering expenses. Note that APL already has high load factors eastbound on the trans-Pacific trade as well as on its double-stack trains. Therefore, the best way to raise revenue is by increasing the price per container rather than the number of containers. Note that between 1984 and 1986 on the trans-Pacific trade the price per FEU had dropped $1,216 Eastbound and $881 Westbound. Also the ratio between the highest and lowest price container was about 5. Since we are talking about

thousands of dollars per container, there may well be potential for raising the price per container enough to pay for a more expensive service.

One new ship will complete a round trip each week moving 3400 TEU in one direction or 6800 TEU in both directions. For one year or 52 weeks the total is 353,600 TEU. Table 1 shows the impact of varying the average incremental revenue per TEU on the faster vessel and calculates the net present value (NPV) over 15 and 25 years at discount rates of 10 to 25%. These numbers show that the NPV of a small average incremental revenue far exceeds the extra cost involved with 5 "fast" ships. For example, the NPV of $5 per TEU average incremental revenue will result in an extra $12 mil. over 15 years at 15%.

The fast ships are totally consistent with APC's overall strategy of high value-added service as shown by the high speed of the rest of the ships in the fleet. In addition to smaller port-to-port times the faster ships provide for a faster overall door-to-door time when coordinated with land transportation. The non-Panamax ships provide the advantage of better seakeeping, less ballast, less horsepower, potential jumboizing, and no need for stratification of containers by weight. Without the need to locate containers by weight, the containers to go on a double-stack train could be loaded to facilitate their quick removal upon arriving at port.

WHAT HAPPENED

The APL staff felt that the potential increase in revenue with the high speed far exceeded any incremental cost involved. APL built 5 "fast" non-Panamax ships. Others have since followed their lead, both in terms of speed and ship width.

TABLE 1

NPV OF INCREMENTAL REVENUE

Discount Rate	$50 Extra Revenue Per TEU $17.68 M Extra Revenue Per Year		$100 Extra Revenue Per TEU $35.36 M Extra Revenue Per Year	
	15 years	25 years	15 years	25 years
10%	$148.00	$177.00	$296.00	$354.00
15%	$119.00	$132.00	$238.00	$263.00
20%	$99.00	$105.00	$190.00	$210.00
25%	$86.00	$88.00	$171.00	$176.00

10-22-93

CHAPTER 9
The Port of Seattle
Teaching Note

TEACHING OBJECTIVES

This case study gets us back to a West Coast focus after visiting Long Beach in Chapter 2 many years earlier and the East Coast (Boston in Chapter 5 and the Port of New York and New Jersey in Chapter 6). The Port of Seattle provides an update on the West Coast, which is benefiting from the introduction of double stack (DS) trains and provides a contrast to the next chapter on the Port of New Orleans.

In analyzing the case study, the student should:

1. Understand how ports compete on a national, interregional and regional basis, and know which factors are within the control of the port authority.

2. Identify what the Port of Seattle has done to position itself competitively.

3. Evaluate the pro's and con's of the proposed on-dock facility.

TEACHING FORMAT

The instructor might tie together this case study with the earlier port-related ones and to serve as an introduction for the next chapter on the Port of New Orleans. I would suggest a discussion of how ports compete and which factors are within their control. In the process the instructor should cover the Non-Intermodal Areas of Inter-Port Competition (pages 185-187) as well as the levels of port competition: national, West Coast or interregional, and regional (pages 186-188). Another general topic is the criteria that ports should use in evaluating investments. It is clear that Seattle is concerned about cargo throughput, jobs and regional benefits as well as revenue.

A discussion of Seattle's competitive position should point out the vulnerability as well as the strengths. It is clear that Seattle's focus is container cargo (and its impact on jobs). However, unlike the Los Angeles/Long Beach

area, Seattle does not have a large local market to support this traffic. Most inbound containers are headed for the Midwest or East Coast; this traffic could go through other West Coasts ports with little problem.

Seattle has been aggressive in trying to keep ahead of the competition with marketing, warehousing, intermodal truck contracting, etc. (pages 188-193). Note that prepaying truckers must be greatly welcomed by the trucking community. Although some of Seattle's features are unique, there is nothing that couldn't be copied by a competitor.

The On-Dock IY

The class discussion should separate the economic and non-economic factors related to the on-dock intermodal yard (IY) investment decision. Tacoma has two on-dock IYs; Portland is expanding its IY. (Even Vancouver has an on-dock IY, albeit without a DS train.) There is great pressure for Seattle to have its own on-dock IY.

The economic considerations are more difficult to deal with. The port is looking at a 5 acre on-dock facility that is 2 to 3 miles from UP's 19-acre cargo yard with 7,680 feet of track and less than 1.5 miles from BN's 29-acre SIG facility with 11,000 feet of track. The trains from such a proposed on-dock IY might cause traffic problems and the entire unit train assembly couldn't take place at the small new facility, but would have to be done in the vicinity of the existing rail facilities. In any event the 2 railroads that currently handled DS trains would have to handle the DS cars from the new facility (possibly as an inconvenience).

Exhibit 8 in the case study shows a savings of $55 per container, but since the existing railroad yards are so close, and since the unit train will have to be made up close to where they already are, the savings seem to be overstated. (In Seattle UP and BN would both charge about $40 for drayage.)

All the containers for a DS train at the proposed facility should come from a single ship (and preferably a single carrier if the ship is shared). A 10-car string was expected to handle 120 boxes (eighty 40 foot containers and forty 20 foot containers).

While the cost of $3.46 million was not huge relative to many investments in the port, it does not seem that profit is (or could be) the prime motivator here. Note that the port's standard cost of $40,000 per acre per year (covering land, pavement, etc.) is less than $1 per square foot per year, quite subsidized for a commercial venture on waterfront property.

To be competitive with Tacoma the facility charge at the new on-dock IY should not exceed $15-20 per box (the new LA/LB ICTF charged $30 per box). As shown from the calculations in Exhibit 1, a volume of 12,500 boxes per year

would result in a cost of $38 to 60 per box, while an annual volume of 50,000 boxes would produce a cost per box of $10 to 15 per box. (Costs are the total of an annual charge of $200,000, made up of $40,000 per acre for 5 acres, plus an annuity over 20 years to pay off the $3.46 million investment at a variety of discount rates.) Of course, the port could set the facility charge low initially to be competitive and in hopes that the volume would increase over time.

WHAT HAPPENED

The port went ahead with the investment. It was a success from a marketing point of view. The port hoped to get back its investment over time.

EXHIBIT 1

COST PER BOX FOR DIFFERENT SCENARIOS

	Interest Rate		
	5%	10%1	15%
20 year annuity to pay back $3,460,000	$277,639	$406,410	$552,774
Annual charge of $40,000/acre	$200,000	200,000	200,000
Total	$477,639	$606,410	$752,774
Cost Per Box If:			
12,500 boxes/yr.	$38.21	$48.51	$60.22
50,000 boxes /yr.	$9.55	$12.13	$15.06

3-21-94

CHAPTER 10
The Port of New Orleans
Teaching Notes

TEACHING NOTES

The case study shows the challenges faced by a public port authority when many of the general cargo trends place it at a disadvantage.

In analyzing the case study the student should:

1. Identify the trends facing the general cargo industry and determine which ones are beyond the control of the port authority.

2. Show that the double-stack train technology, which has done great things for West Coast ports, has penalized the Gulf Coast ports.

3. Determine what actions the port authority can control.

4. Decide a plan of action for the port authority.

TEACHING FORMAT

I like to get the key issues up on the blackboard in such a way that the student can understand which factors the port authority has control over. One might start with a general question such as "What do you think the key factors in the case study are?" or "What are the general trends affecting the liner industry?" You might place the replies from the students in two columns. Whey they are through you might label them "Outside the Port's Control" and "Within the Port's Control".

The trends will show that the U.S. foreign trade through the Gulf Coast ports has been level. Trade with the Far East, which greatly favors West Coast ports has been growing fast, while trade with Latin America and the Caribbean, which is important to New Orleans, has been stagnant. The double stack trains have developed in the east-west direction, but not the north-south direction.

This new technology has only hurt the Port of New Orleans at this point. These developments have been beyond the control of the Port of New Orleans.

The port is in poor financial condition. It is located many miles from the ocean. Ocean carriers have to face physical restrictions, occasional fog, and pilotage and tug fees.

The port cannot change its overall situation relative to container traffic. Even brand new container terminals would not significantly change their competitive position.

The rail connections are one area where the port might have an impact. Exhibit 8 of the case study shows that the rates from Chicago to New Orleans ramp-to-ramp are quite competitive, but the ramp-to-pier rates are $75 higher, making them still competitive, but less so. When you include the high port costs from Exhibit 9, they become less competitive as shown below.

Total Cost: Chicago to Gulf Comparison
(20' Container)

	New Orleans	Houston	Mobile
Rail Cost (Ramp-to-Pier)	$680	$670	$680* (Exh.8)
Port Cost (Charges & Operating)	160	138	111 (Exh. 9)
	$840	$808	$791

*Assumed

This simple illustration shows that the port should be more concerned with rail connections and longshoremen charges than with building new container terminals. Use of double stack trains would also aid the port (assuming efficient movement to and from the docks).

WHAT HAPPENED

In terms of new facilities, the port placed its money on new break-bulk cargo facilities for commodities such as steel and food products. The port tried to improve its position for container cargoes with less expensive solutions such as marketing, advertising and more efficient rail connections.

3-7-94

CHAPTER 11

CAST (1983), LTD.
Teaching Notes

TEACHING OBJECTIVES

This case study allows the student to analyze a niche market (i.e., conbulker) player and determine the options available to it. The case study is a sequel to the Cast Lines case study in the Marine Transportation Management book and takes place after the passage of the Shipping Act of 1984.

In analyzing the Cast (1983), Ltd. case study the student should:

1. Describe the competitive position that Cast is in and how it has been affected by the Shipping Act of 1984.

2. Consider the presence of its competitors (or their subsidiaries or partners) in the running of its operations.

3. Identify the decisions to be made and options possible.

4. Choose a course of action.

TEACHING FORMAT

I suggest the instructor start by asking the students to describe what factors have made Cast successful and what is the company's competitive position in the fall of 1989. The company had originally been successful as a non-conference operator focusing on the niche market of containers, dry bulk and break-bulk cargoes with its uniquely designed conbulkers. The company had slow 14.5 knot ships and poor service in the winter but managed to have a package of price and service that made it profitable. It charged a single rate for each origin-destination pair unlike the normal practice of varying rate with cargo value and other factors.

The Shipping Act of 1984 allowed carriers using U.S. ports to compete more effectively with Cast. The Shipping Act facilitated the setting of origin to

destination intermodal rates, allowed carriers to purchase carriers in other transportation modes, and allowed shipping companies to offer time-volume discount rates (called service contracts) to shippers. Carriers using U.S. ports were still required to file ocean rates unlike their competitors using Canadian ports.

The market position of Cast had changed in recent years. Originally, Cast was a major non-conference player and had a major advantage relative to the "low end" of the market (i.e., low value, probably high density, rate sensitive, not particularly time sensitive cargoes) with its lower than conference rates. Now as an associate conference member, it faced competition from a combination of independent carriers with twice its capacity and lower rates (and often lower service levels but maybe not during the winter). Improved rail service in North America has helped Cast provide better service to its customers. However, in relative terms, it has probably been of greater help to Cast's competitors using Halifax and U.S. ports.

Cast now has its competitors represented in its operations on both sides of the Atlantic. In Canada, CP Rail is tied to Canadian Pacific Steamship which is part of Canada Maritime. In Europe Hessanatie, which is the operator of the Antwerp terminal, is part of CMB, which is also part of Canada Maritime.

DECISIONS AND OPTIONS

Exhibit 1 lays out the key decisions. In working through the options, the instructor should focus on whether the company should stay with its market niche or take a different path.

Another Feeder Service -- It may be synergistic in providing both intra-European and transatlantic cargo; however, it may not be profitable in an overtonnaged environment using odd sized containers and swopbodies.

A Sixth Conbulker -- The Beaver, a sixth sister ship could provide added capacity in Cast's niche market with greater sailing frequencies; however, the sailing schedule would be more frequent than the standard fixed-day-of-week sailings. Note that the case study provides no data on overtonnaging in the overall U.S. Northeast-Europe market.

Larger Conbulkers -- Larger ships would have economies of scale but might restrict the ports that could be used in terms of water depth and cranes. To provide weekly sailing, 4 or 5 new ships would be needed.

Buy Containership(s) or Dry Bulker(s) or Tanker(s) -- Specialized ships would allow for a more competitive position in a specialized market; however, this would be outside the conbulkers market niche.

Move From Montreal and/or Antwerp -- Both decisions have pro's and con's. Cast has a lease with Montreal until 2000. While both Quebec and Halifax have advantages, neither has the right combination of container facilities, bulk facilities, water depth and rail connections at present. Contrecoeur might have more potential in the future.

Antwerp has problems with the CMB-connection as well as the locks which restrain size, cause time delays and sometimes result in vessel damage. Zeebrugge has potential but needs new facilities (and hopefully generous financing terms).

Use Larger Containers -- While larger containers would appeal to a certain segment of the market that Cast is probably not now serving, they would potentially cause operational problems to its straightforward operations. In addition, if the cargo for these containers was time-sensitive, Cast still might not get the cargo.

WHAT HAPPENED

Cast bought the Beaver and began a conbulker service with a six day frequency. Apparently Cast's customers did not mind the lack of a fixed day-of-week service. Cast also started a feeder service as pictured in Exhibit 9 of the case study. Cast also moved into a brand new container facility in Zeebrugge with very generous financial arrangements. This change removed Cast from the Hessanatie-operated facility. River barge companies started operations between Zeebrugge and the Rhine River.

Unfortunately, the overall situation on the North Atlantic trade worsened. In bargaining with its fellow conference members to decrease capacity overall, Cast withdrew one conbulker (and used it as a dry bulker through Pan Bulk Shipping). Other conference members made other concessions. The new feeder service was not profitable and was discontinued. (Eventually, the original feeder service was discontinued too.) By 1994 Cast was waiting for the market to improve.

EXHIBIT 1

CAST'S KEY DECISIONS

	YES		NO
	NOW	LATER	
Start Another Feeder Service			
Buy a 6th Conbulker			
Buy Larger Conbulker(s)			
Buy Containership(s)			
Buy Drybulker(s)			
Buy Tanker(s)			
Move Out of Antwerp Montreal			
Use Larger Containers			