

# STRATEGIC ANALYSIS OF A BULK TERMINAL

By

Wade Everett Leslie  
Bachelor of Commerce, University of Manitoba 1997

PROJECT SUBMITTED IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF BUSINESS ADMINISTRATION

In the  
Faculty  
of  
Business Administration

Executive Master of Business Administration

© Wade Everett Leslie 2005

SIMON FRASER UNIVERSITY



Summer 2005

All rights reserved. This work may not be reproduced in whole or in part,  
by photocopy or other means, without permission of the author.

## APPROVAL

**Name:** Wade Leslie

**Degree:** Master of Business Administration

**Title of Project:** Strategic Analysis of a Bulk Terminal

**Supervisory Committee:**

---

Senior Supervisor  
Ed Bukszar, Associate Professor

---

Second Reader  
Neil Abramson, Associate Professor

**Date Approved:**

August 11, 2005

# SIMON FRASER UNIVERSITY



## Partial Copyright Licence

The author, whose copyright is declared on the title page of this work, has granted to Simon Fraser University the right to lend this thesis, project or extended essay to users of the Simon Fraser University Library, and to make partial or single copies only for such users or in response to a request from the library of any other university, or other educational institution, on its own behalf or for one of its users.

The author has further granted permission to Simon Fraser University to keep or make a digital copy for use in its circulating collection.

The author has further agreed that permission for multiple copying of this work for scholarly purposes may be granted by either the author or the Dean of Graduate Studies.

It is understood that copying or publication of this work for financial gain shall not be allowed without the author's written permission.

Permission for public performance, or limited permission for private scholarly use, of any multimedia materials forming part of this work, may have been granted by the author. This information may be found on the separately catalogued multimedia material and in the signed Partial Copyright Licence.

The original Partial Copyright Licence attesting to these terms, and signed by this author, may be found in the original bound copy of this work, retained in the Simon Fraser University Archive.

W. A. C. Bennett Library  
Simon Fraser University  
Burnaby, BC, Canada

## **ABSTRACT**

The paper entitled “A Strategic Analysis of a Bulk Terminal” investigates the effectiveness of Pacific Coast Terminal’s competitive strategy and how the company’s processes align with that strategy. The paper begins with a brief description of the company. An industry analysis is completed describing the environment Pacific Coast Terminal operates in. Next, an analysis of the company is conducted providing information relating to its strategy, services, structure, and financial state. Following this description is an analysis of major issues facing Pacific Coast Terminals and recommendations that address these issues. The company has issues in employee experience, project management skills, information technology, employee skill levels, safety, capacity and logistics, customer relations, reliance on high volumes, and public relations. Overall the company operates successfully and requires the issues that are outstanding are relatively minor. Pacific Coast Terminals will continue to be successful without implementing any changes.

## **DEDICATION**

This paper is dedicated to everyone that has supported me through the completion of my degree. You know who you are.

## **ACKNOWLEDGEMENTS**

I wish to acknowledge all my professors who taught me a great many things. I also wish to acknowledge the staff at Pacific Coast Terminals, for freely sharing their knowledge of the company and the industry.

# TABLE OF CONTENTS

<b>Approval .....</b>	<b>ii</b>
<b>Abstract.....</b>	<b>iii</b>
<b>Dedication .....</b>	<b>iv</b>
<b>Acknowledgements.....</b>	<b>v</b>
<b>Table of Contents .....</b>	<b>vi</b>
<b>List of Figures.....</b>	<b>viii</b>
<b>List of Tables .....</b>	<b>ix</b>
<b>List of Abbreviations and Acronyms.....</b>	<b>x</b>
<b>1 Introduction and Overview.....</b>	<b>1</b>
1.1 Introduction .....	1
1.2 Overview of the Company .....	1
1.3 Company History .....	3
1.4 Services Offered.....	4
1.5 Market Overview .....	5
<b>2 Industry Analysis.....</b>	<b>9</b>
2.1 Industry Overview.....	9
2.2 Porter's Five Forces .....	9
2.3 Overall Industry Assessment.....	19
2.4 Key Success Factors.....	19
<b>3 Internal Analysis.....</b>	<b>21</b>
3.1 Strategic Fit .....	21
3.2 PCT Value Chain .....	29
3.3 Primary Activities .....	31
3.4 Support Activities.....	47
3.5 Analysis of Value Chain .....	63
3.6 Financial Analysis.....	63
<b>4 Issues.....</b>	<b>69</b>
4.1 Employee Experience and Turnover .....	69
4.2 Project Management.....	70
4.3 Information Technology.....	70
4.4 Skilled Labour Pool.....	71
4.5 Safety and Accident Prevention .....	71
4.6 Capacity and Logistics .....	72
4.7 Customer Relations .....	72
4.8 Product Volume Reliance.....	73
4.9 Public Relations .....	74

<b>5 Recommendations.....</b>	<b>75</b>
5.1 Supervisor Experience.....	75
5.2 Project Management.....	76
5.3 Information Technology Outsourcing.....	77
5.4 Employee Skill Levels.....	77
5.5 Safety Improvements.....	78
5.6 Capacity and Logistics Problems.....	79
5.7 Customer Relations.....	80
5.8 Product Volume Reliance.....	81
5.9 Public Relations Improvements.....	81
5.10 Implementation.....	81
5.11 Conclusion.....	84
<b>Appendices.....</b>	<b>86</b>
Appendix 1 – PCT Balance Sheets.....	86
Appendix 2 – PCT Income Statements.....	87
Appendix 3 – PCT Cash Flow Statements.....	88
Appendix 4 – PCT Financial Ratios.....	89
Appendix 5 – Free Cash Flow.....	90
Appendix 6 – Economic Added Value Calculations.....	91
<b>Reference List.....</b>	<b>92</b>



## LIST OF FIGURES

Figure 1 - Chinese Sulphur Demand .....	3
Figure 2 - PCT Sulphur Statistics.....	6
Figure 3 - PCT Glycol Statistics .....	7
Figure 4 - Port of Vancouver Tonnage Statistics .....	10
Figure 5 - Forces in the Industry .....	11
Figure 6 - PCT Strategic Fit .....	22
Figure 7 - PCT Level Value Chain.....	30
Figure 8 - Inventory Pile Calculations .....	40
Figure 9 - PCT vs. Waterfront Accidents.....	53
Figure 10 - Management Experience at PCT .....	58
Figure 11 - Foremen Years Experience at PCT .....	59

## LIST OF TABLES

Table 1 - PCT Sulphur Operating Capacity .....	6
Table 2 - PCT Glycol Capacity .....	8
Table 3 - PCT Labour Productivity .....	27
Table 4 - Sulphur Labour .....	34
Table 5 - Glycol Labour .....	36
Table 6 - Profitability Ratios .....	64
Table 7 - Asset Utilization Ratios .....	65
Table 8 - Measures of Liquidity .....	65
Table 9 - Financial Leverage Measures .....	66
Table 10 - Invested Capital Measures .....	66
Table 11 - Free Cash Flow .....	67
Table 12 - Sustainable Growth Rate .....	68
Table 13 - Economic Value Added .....	68

## LIST OF ABBREVIATIONS AND ACRONYMS

<b>AP</b>	Accounts Payable
<b>AR</b>	Accounts Receivable
<b>BCR</b>	British Columbia Railway
<b>CBA</b>	Collective Bargaining Agreement
<b>CNR</b>	Canadian National Railway
<b>CPR</b>	Canadian Pacific Railway
<b>Dow</b>	Dow Chemicals Canada
<b>EBIT</b>	Earnings Before Interest and Taxes
<b>EBITDA</b>	Earnings Before Interest Taxes Debt and Amortization
<b>EVA</b>	Economic Value Added
<b>Glycol</b>	Monoethylene Glycol
<b>HRDC</b>	Human Resources and Development Canada
<b>ILWU</b>	International Longshore and Warehouse Union
<b>PCT</b>	Pacific Coast Terminals
<b>R &amp; D</b>	Research and Development
<b>ROIC</b>	Return On Invested Capital
<b>RWF</b>	Regular Work Force
<b>Shell</b>	Shell Chemicals Canada
<b>VW</b>	Vancouver Wharves
<b>Wi-Fi</b>	Wireless Fidelity

# **1 INTRODUCTION AND OVERVIEW**

## **1.1 Introduction**

The purpose of this paper is to evaluate the current strategies employed by Pacific Coast Terminals Co. Ltd. (PCT). PCT is a company that completes its core goals well (cost reduction); however, there are some areas that need improvement to continue to minimize costs. This paper has five chapters. Chapter 1 provides an overview of the company. Chapter 2 provides an in-depth analysis of the marine bulk shipping industry. Chapter 3 includes an analysis of the internal functions of the company. Chapter 4 identifies key issues facing PCT, as brought forward in the previous chapters. Chapter 5 will present strategic recommendations to the key issues and challenges involved in the implementation of these recommendations.

## **1.2 Overview of the Company**

PCT is one of the largest bulk export terminals in the Port of Vancouver. It is also the largest sulphur export terminal in the world. It is located on the Burrard Inlet in Port Moody, BC. Bulk sulphur is shipped from BC and Alberta by railcar to PCT and then loaded onto vessels for export. In addition to bulk sulphur, PCT also ships bulk liquids (Monoethylene Glycol). PCT handles approximately 180 deep-sea vessels and 55,000 rail cars annually.

Bulk sulphur comes from two sources: mining and recovery. Mined sulphur comes from all over the world, but the amount of sulphur recovered from mines is quickly dwindling. Recovered sulphur, handled by Sultran and PCT, occurs during the processing of oil and natural gas. Although considered a by-product, recovered sulphur is growing in importance and has been the leading source of sulphur in the United States since 1982 (Ober 15).

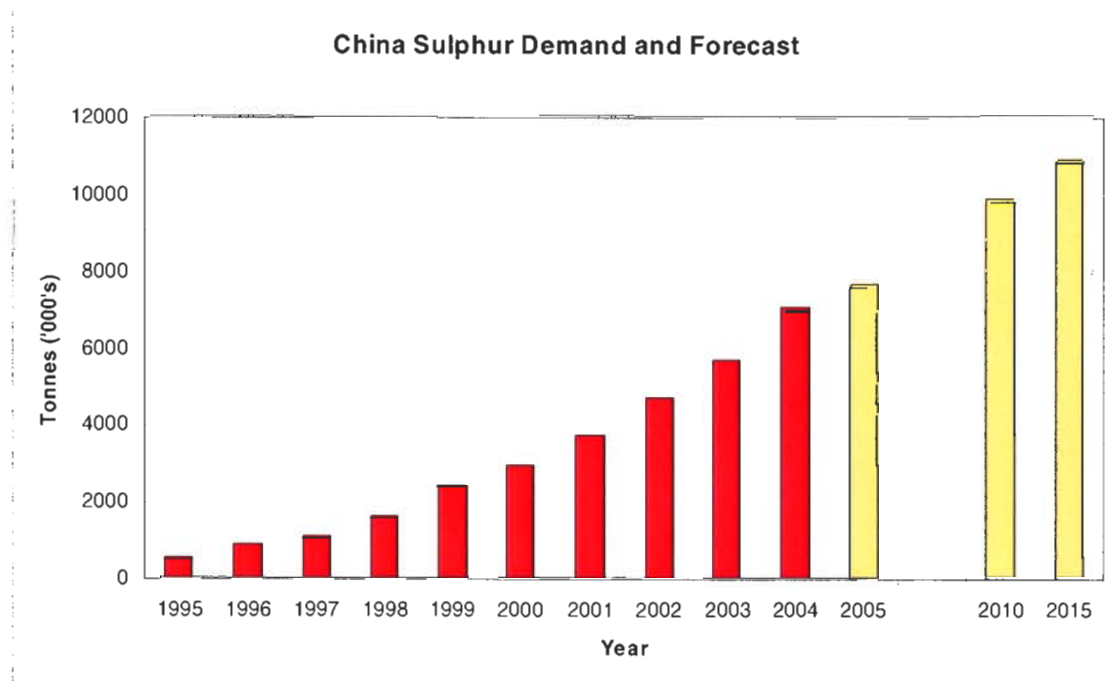
Calling sulphur a by-product is misleading as most oil and gas producers view sulphur as a waste product, which is either stockpiled in huge blocks beside the refineries or sold for export. Selling the sulphur is the preferred choice as “pouring to block”, which is the process of storing the sulphur in large blocks that stretch for miles outside the forming plants, is an expensive process and requires (for environmental purposes) disposal at a later date. The shipping costs usually eliminate most of the profit, but because it is a waste product, producers are happy to get rid of it for the lowest cost possible.

PCT can store up to 220,000 tonnes of sulphur on site and ships approximately four and a half million tonnes per year. Sulphur is primarily used in the production of fertilizers as well as many other products like paint, textiles, and pharmaceuticals. It is also used as a catalyst in the synthesis of many industrial processes.

Glycol operations minimize the cost of the sulphur side of the business. Monoethylene Glycol (glycol) arrives from Alberta by rail and is stored in large tanks with capacities of approximately 60,000 tonnes before being shipped to Pacific Rim ports, including Japan, Indonesia, Hong Kong, and Taiwan. Almost one million tonnes is shipped yearly through PCT. Glycol is used in the production of polyester and plastics. It can also be used as antifreeze, primarily for internal combustion engines.

PCT is a wholly owned subsidiary of Sultran Ltd., a privately owned sulphur transportation and logistics service company. Sultran is itself owned by a consortium of oil and gas producers that create the sulphur. Essentially, PCT acts as a cost centre for the owners of Sultran to dispose of the sulphur for the lowest possible cost. Fortunately, sulphur has many applications. Its largest use is in fertilizer to raise acidity levels in soil that is not acidic enough to grow crops. The majority of sulphur is exported to China, where demand is growing (see figure 1).

**Figure 1 - Chinese Sulphur Demand**



*(Source: Clarke)*

PCT generates revenue in two ways. The first is through fees charged to vessels for the right to sit at PCT's berth and to receive services such as potable water. The second and largest source of revenue comes in the form of tariffs<sup>1</sup> charged to Sultran. These tariffs are charged per tonne of product loaded on a vessel. The price of the sulphur or glycol loaded on a vessel has no bearing on the revenue that PCT generates. The only connection between the price of the product and PCT's revenues is that world prices cause demand to rise or fall creating more or less shipments through PCT.

### **1.3 Company History**

Pacific Coast Terminals was established in 1929 with a terminal in New Westminster, which was built to handle a variety of products. In 1958, the Port Moody location was established to handle bulk commodities. Port Moody was the closest in proximity to the Canadian Pacific Railway's yard in Coquitlam.

---

<sup>1</sup> Tariff is an industry term for the price charged to customers for loading products, usually expressed in dollars per tonne.

Originally, the Port Moody terminal loaded coal, but soon expanded into sulphur and fertilizer. In 1981, the New Westminster location was sold and today is known as the Westminster Quay Public Market. As coal shipments began to decrease in 1981, Sultran purchased PCT. Sultran initiated a complete terminal modernisation project to upgrade the facilities at PCT to handle sulphur specifically.

## **1.4 Services Offered**

PCT fills one step in the logistics chain in the transportation of sulphur and glycol. Products arrive at PCT and are loaded onto vessels for transportation to foreign customers. PCT stores products waiting for shipment on site in piles (for sulphur) or large tanks (for glycol). Although Sultran owns PCT, the shipments are not exclusively moved through PCT. Vancouver Wharves (VW), although more expensive, is used as a redundant terminal in case of failure or capacity concerns at PCT. VW is a crown corporation and is part of the BCR Marine group of companies. PCT ships roughly four to six times more tonnage of sulphur than VW. The ownership structure allows for closer communication and interaction than would exist if Sultran did not own PCT.

Pacific Coast Terminals is also the largest bulk liquid terminal in the Port of Vancouver. The Dow Chemical Company and Shell Chemical Canada ship nearly one million tonnes of glycol through PCT every year to various destinations around the world. The world market for glycol is estimated to be about 14 million tonnes (Channels newsletter, Spring 2003). Although Dow Chemical has its own terminal in Vancouver, due to logistics constraints (space and capacity) it sends the majority of its glycol production through PCT.

## 1.5 Market Overview

Sulphur shipped through PCT is owned by oil and gas companies and is sold throughout the world market; organizations buy and sell sulphur based upon the prevailing market price, which is set on the open market. There is one key difference between a typical mineral resource industry and the sulphur industry. Most resource-based industries are continually looking for ways to increase efficiencies in extracting minerals from ore; the sulphur industry must find innovative ways to use the growing sulphur supply. (Ober 2)

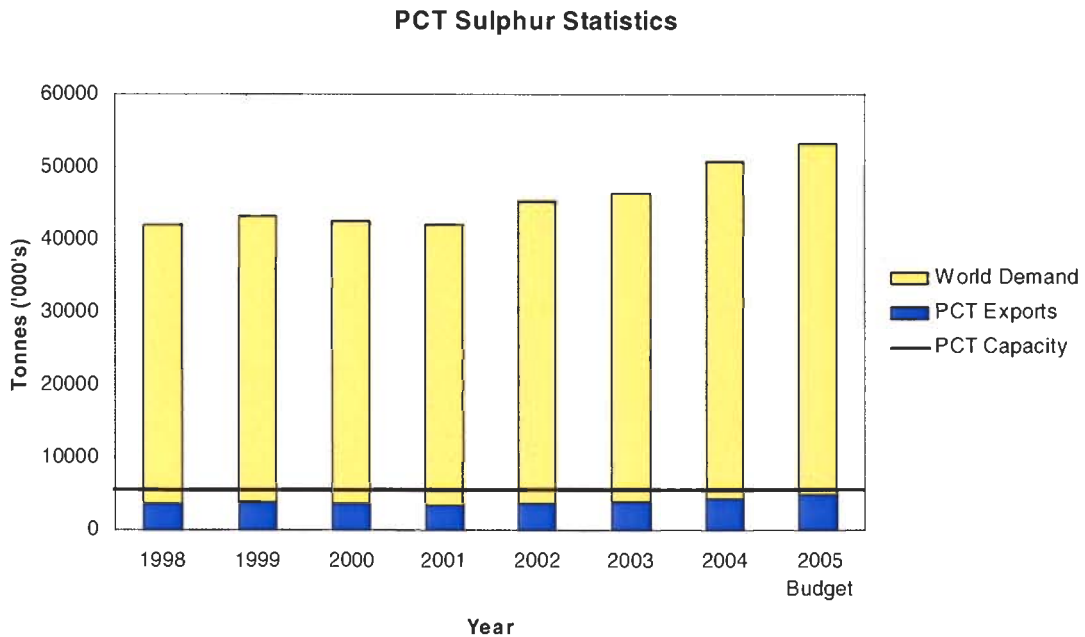
Increasing environmental concerns cause the removal of more and more sulphur from fuels and oils. This has created a steadily increasing supply of sulphur. Along with most commodity resources in recent times, sulphur prices have seen a recovery. This recovery is almost entirely attributed to the resource demands of China. The growth of China along with its growing need for sulphur has helped the industry cope with its increasing supply. The worldwide transportation infrastructure (of which PCT plays a big part) is well developed and enables sulphur to be transported anywhere in the world at relatively low prices. Figure 2 shows PCT's sulphur throughput compared to world demand.

Sulphur shipped through PCT supplies approximately 9 % of world demand. This number is larger when considering the actual world trade of sulphur. There is a large amount of sulphur that is produced and used internally by companies and countries alike and not exported. For instance, China produces sulphur, but uses all of it to meet its internal needs and it does not reach the open market.

PCT has a theoretical capacity to transport up to 15 million tonnes of sulphur per year. However, many factors prevent maximum capacity. Railway bottlenecks, public relations issues, and downtime for maintenance are a few factors that reduce PCT's capacity. In reality, without further capital investment, management estimates that the terminal has an operating capacity of



**Figure 2 - PCT Sulphur Statistics**



*(Source: Clarke and Leslie)*

approximately five and a half million tonnes. Table 1 shows that PCT is currently operating at 80% of its operating capacity.

**Table 1 - PCT Sulphur Operating Capacity**

<b>PCT Sulphur Capacity</b>							
<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005 Est.</b>
65%	70%	66%	62%	65%	70%	80%	86%

*(Source: Leslie)*

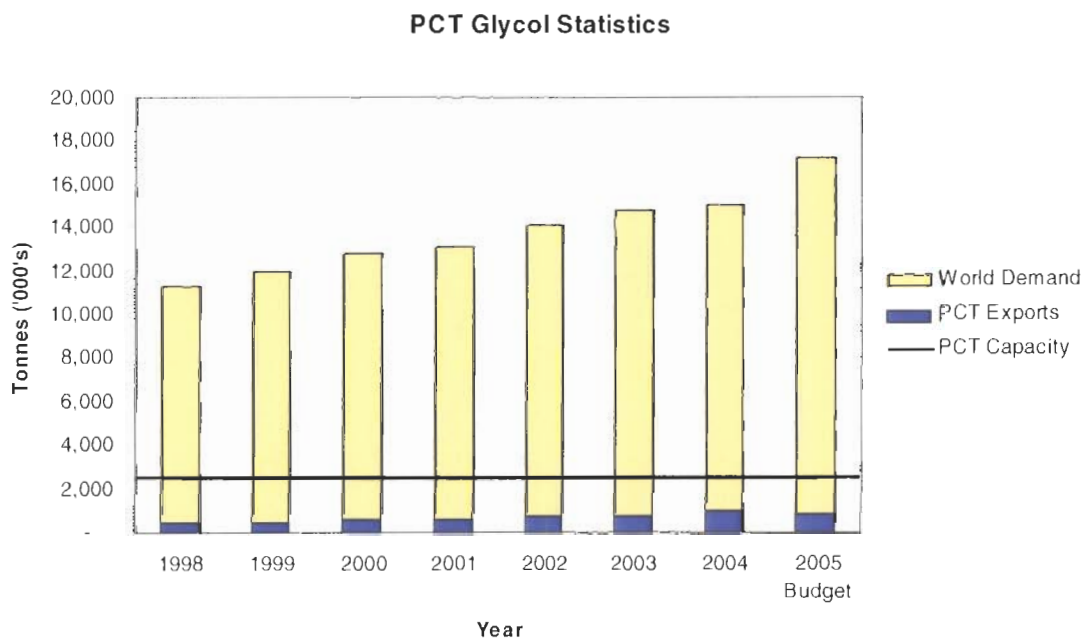
Sulphur, as a basic element, is homogeneous. Different producers differentiate their product by changing its physical form. PCT ships three different types: Prill (small pebbles), Rotoform (small half spheres), and Slate (larger flat-gravel shaped pieces). The Prill and Rotoform are marketed as premium products. However, there is no difference in each type's chemical composition.

Shell and Dow ship glycol through PCT to various customers around the Pacific-Rim. Approximately 9,000 cars of glycol arrive at PCT every year for loading into bulk liquid vessels. Glycol is traded on the open market and experts predict that world demand for will grow by five

to six percent per year for the foreseeable future (Dow Website 2005). Although it is traded on world markets, the majority of glycol is bought and sold through large, long-term contracts. These contracts are variable and move in tandem (through various formulas) with world spot markets.

The theoretical glycol capacity at PCT is approximately 3.25 million tonnes. The operating capacity is 2.5 million tonnes. While the liquids division suffers from much of the same constraints as the sulphur division, the operating capacity is much closer to the theoretical capacity because of less complex equipment and maintenance requirements. The real bottleneck is the unloading rate from railcars, which have to be stored before shipment, unlike sulphur, which can be loaded directly onto a vessel from a train.

**Figure 3 - PCT Glycol Statistics**



*(Source – Bryan and Rightler 21, Leslie)*

As indicated in figure 3, PCT ships just over 7% of the world's demand for glycol.

Currently, PCT is operating at 40% of capacity. Table 2 shows the recent historical trend of

capacity rates for the liquids division of PCT. In 2004, both the glycol and sulphur divisions had large increases in capacity utilization.

**Table 2 - PCT Glycol Capacity**

<b>PCT Glycol Capacity</b>							
<b><u>1998</u></b>	<b><u>1999</u></b>	<b><u>2000</u></b>	<b><u>2001</u></b>	<b><u>2002</u></b>	<b><u>2003</u></b>	<b><u>2004</u></b>	<b><u>2005 Est.</u></b>
19%	18%	24%	24%	30%	30%	40%	33%

*(Source: Leslie)*

## **2 INDUSTRY ANALYSIS**

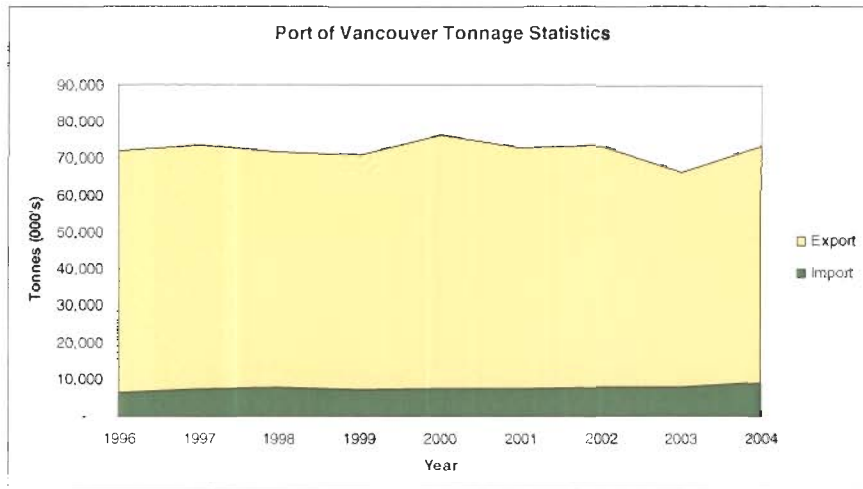
### **2.1 Industry Overview**

Bulk cargo accounts for three-quarters of the annual throughput for the Port of Vancouver, the largest port in North America in terms of foreign export tonnage (Port of Vancouver Economic Impact Study, 2003). The port is directly responsible for providing 31,100 direct jobs, \$1.8 billion in GDP contributions, and \$763 million in tax revenues. When accounting for related impacts, the port provides 69,200 jobs and \$4 billion in GDP contributions. The figure below shows the recent throughput for the port. Bulk terminals in the Port of Vancouver exported 64.7 million tonnes of products in 2004; at the same time, 8.8 million tonnes of product was imported through these terminals (see figure 4). These tonnages represent 76% of the total throughput of the port; although the value is low when compared to the products shipped through break bulk or container sites. (All statistics courtesy of the Port of Vancouver Economic Impact Study, 2005). Two national railways service the Port of Vancouver, the Canadian National Railway (CNR) and the Canadian Pacific Railway (CPR). There are 19 bulk terminals in the Port of Vancouver and hundreds in North America.

### **2.2 Porter's Five Forces**

Drawing on Porter's Five Forces model in figure 5 (Porter, 2), the following chart provides an overview of the forces that affect the industry. The effect that each factor has upon the industry is discussed below. Porter's model allows the identification of the key factors that are the basis of PCT's competitive advantage.

**Figure 4 - Port of Vancouver Tonnage Statistics**



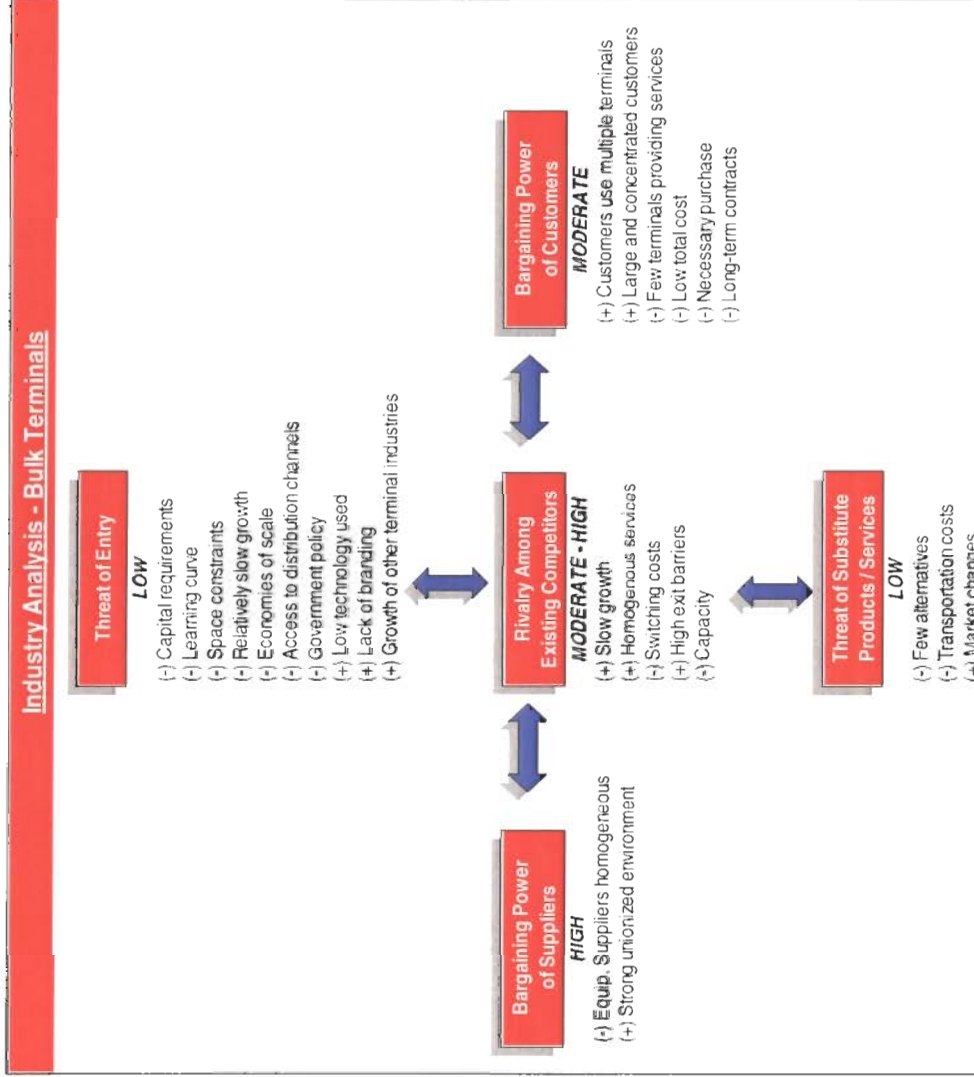
(Source: Port of Vancouver Economic Impact Study, 2005)

### **2.2.1 Threat of Entry**

The threat of entry in the bulk terminal industry is low due to a number of factors. First, starting a terminal is difficult. There are many hurdles and barriers to clear before a company can even begin to design a terminal. The port industry is quite stable with new entrants being rare. A new entrant usually occurs because the existing terminals cannot meet the demands required of them.

All terminals are large heavy industrial sites, requiring a large amount of capital to build. The largest capital requirement is for the equipment infrastructure costs. Deep-sea terminals have many large, custom-made pieces of equipment. Few companies in the world design and manufacture machines capable of moving millions of tons of material. In addition, the large specialized equipment can take a year or more to assemble (which occurs on location). Owning or leasing land in a port is very expensive due to the nature of its location (waterfront). As well, environmental studies must be carried out before any terminal can proceed. Environmental studies cost millions of dollars. The cost of starting a terminal can easily reach hundreds of millions of dollars.

Figure 5 - Forces in the Industry



(Source – Adapted from Porter 1979 and Bukšar2005)

Another barrier to entry is the associated learning curve that accompanies the industry. Maximizing efficiencies out of the equipment takes time. Tacit experience is gained by running the equipment and making mistakes and then learning from them. It can take years for operations personnel to maximize efficiencies out of the machinery and for maintenance personnel to learn the proper routines for maintenance of these complex machines.

Space or more specifically, the lack of space also creates a barrier to entry into the industry. The existing infrastructure ensures that ports exist in only a few highly industrialized urban areas (a classic example of clusters). A new competitor must purchase large parcels of land in these areas to build a new terminal. Although, this may be difficult to do, it is not impossible.

A large company, particularly a company already involved in some area of transportation, could enter the industry by investing in an under-developed area to build an entirely new terminal supported by its existing infrastructure. This would require cooperation and/or a partnership from a railway to enable product to arrive and/or leave the terminal site.

Any bulk product shipped through a terminal is by definition a commodity. Recent world demand for many bulk commodities has increased. However, historical commodity growth has been slow and stable. This slow growth creates a lack of perceived opportunity in the industry.

Currently, logistics channels (e.g. railway cars, tracks, locomotives, roads, trucks, etc.) are operating at or near capacity (mostly because of the huge surge in container traffic). As a result, any new terminal would require extra capacity be introduced into the system. As existing terminals have long-term contracts with all the various railways and trucking services, a new terminal would be required to negotiate existing capacity away from current terminals, build more infrastructure capacity itself, and/or hope that the required infrastructure changes will occur on their own accord.

Government policy can be a deterrent to new entrants. Port Authorities are quasi-governmental agencies that administer working ports. They regulate the terminals in areas such as pollution, environmental protection, and safety. Port Authorities usually own most of the land that terminals operate on. Any new entrant must satisfy this agency and successfully navigate the red tape associated with it. This can take a long period of time; for example, the Deltaport container terminal in Roberts Bank, BC took over 5 years to gain government approval before it was operational. Deltaport's owners understood the delays red-tape causes as they already operated a terminal in the port.

Another significant factor that lowers the threat of entry is that other types of terminals are experiencing unprecedented growth. Container traffic has risen by an average of 10% per year since the early 1990's and this growth is expected to continue as world trade grows (Mongelluzzo 17). The profits (and capital) are creating a strong demand for more container terminals at the expense of terminals in the bulk industry. The success of these container terminals distracts investors from the opportunities in the bulk industry and creates difficulty in raising the necessary funds to open and operate a bulk terminal. However, bulk commodities will still be required. This may require the creation of new terminals or even entire ports. The port in Prince Rupert, BC has seen resurgence in interest because of this exact issue.

Efficiency gains have the ability to alleviate the shortage of capacity and diminish the threat of entry into the industry. As described in the market overview, PCT's practical capacity runs at approximately 1/3 of its theoretical capacity. This is not atypical in the bulk terminal industry. Tremendous gains in capacity are achievable if terminals can increase efficiencies and reduce bottlenecks by even a small amount. This will require effort and coordination between major players in the industry. The terminals can work to reduce bottlenecks, improve inefficient work practices, and foster better communication. In addition, outside stakeholders must be



convinced to change their work practices. The industry can assist in improving inefficiencies in vessel operations, railways operations, and union management.

While the above discussion illustrates that the industry is unlikely to see a new entrant, a few factors increase the threat of entry. In general, the industry has a low technology requirement. A conveyor is a conveyor. As mentioned above, there is a learning curve to operate the terminal; however, the equipment necessary to run it has been around for decades. Perfecting the operation takes time, but new terminals can hire experienced employees to bring operations quickly up to speed.

### **2.2.2 Bargaining Power of Customers**

Customers have a moderate amount of power in the bulk industry. Customers are defined as parties that are invoiced by the terminals for services performed. They can be suppliers or buyers of the commodity, depending on the relationship, and either may pay for terminals services.

Buyers are concentrated and large, giving them a degree of power. Customers can also use multiple terminals to ship their products. This allows them to play the terminals against each other in contract negotiations. However, in reality most customers want a degree of redundancy in their logistics system to ensure adequate services because breakdowns are common in this industry. To ensure the delivery of product, customers use more than one terminal (a standard operating procedure). This tends to balance things out, but overall the threat of shifting business between terminals increases customer power.

Another factor that increases customer power is the integrated nature of the industry. While not every terminal is integrated, many terminals are facing the credible threat of

integration. Shippers of bulk commodities, buyers of bulk commodities, and others (such as vessel operators) all own terminals. A terminal can be a wise investment for a logistics company.

Customer power is decreased by a variety of factors. There are few terminals within the geographic constraints available to shippers. The transportation costs and limited number of terminals lessen the power of the customer. The terminals know the customer must ship the product from somewhere and they are aware of the constraints involved.

Customer power is weakened by customers' need for the product to continue moving. Customers are unable to wait for better terms to have the product shipped. A disruption in the supply can be extremely costly for their manufacturing processes. Furthermore, once manufacturing processes begin, it is often costly to stop. Customers can moderate this risk to some extent by stockpiling bulk products, but eventually they will require more raw materials.

That most terminals enter into long-term contracts with other members of the logistics chain also decreases customer power. These contracts can last for decades. A long-term contract can mean a large portion of a terminal's business is locked-in. This lock-in is a source of advantage that customers use during contract negotiations to increase their power over the terminals, but during the contract, the terminals use the terms of the agreement to their advantage.

Terminal tariffs are usually low relative to the entire manufacturing cost of the product. A commodity may cost 50 to 100 dollars a tonne, but the costs to process the good into a final product can be many multiples of that. The tariffs are a fraction of a percent of the total cost. As a result, the terminal function in the entire process is not a primary issue for the customers; their efforts and resources are more effectively used elsewhere. In this sense, the relatively low terminal cost decreases the customer power on the industry.

Customers exert their influence on PCT in a number of ways. Many of these ways increase the possibility of rivalry between PCT and its competitors. Large companies pitting terminals against each other in contract negotiations and their ability to move creates a significant amount of pressure on the company, which is partially offset by the integrated nature of the industry and the customers necessity for product to keep their own operations running.

### **2.2.3 Bargaining Power of Suppliers**

The power that suppliers can exert on the industry is high. Terminals must focus on labour and equipment suppliers, more than any other single area. Although there may not be a current threat from this area, the power that suppliers exert on the industry can be very detrimental if not monitored and a strategy is not in place to manage them.

The most important factor is organized labour. All ports in North America (and in most of the world) must use members of the International Longshore and Warehouse Union (ILWU). The Canadian ILWU website states that the union must be “involved in the loading, unloading and checking of cargo to and from vessels and the storage of these goods on the docks and in warehouses.” (ILWU Canada website, 2005)

The ILWU is one of the strongest and most militant unions in the world. It has the ability to shut down international trade. If one terminal has a labour issue, the entire geographical location faces the threat of a shut down. For example, in late 2003 the ports on the west coast of the United States were shut down by an ILWU strike. This shutdown cost approximately \$2 Billion (USD) a day (Olver, FP5).

The ILWU realizes the power it wields and uses it to its advantage. The credible threat of work stoppages or slowdowns is a constant concern to terminals.

Equipment suppliers provide homogenous products to the terminals for day-to-day operations. While terminals are large customers for these types of suppliers, they are not the only customers. Equipment suppliers can survive losing a terminal, which tends to balance out some of the power that the terminals hold over them.

The most influential factor on terminals in this area is organized labour. Organized labour can significantly impact operations. Although all terminals must work with the same union, varying degrees of cooperation and /or labour management exists which can lead to a better competitive standing between terminals.

#### **2.2.4 Threat of Substitute Products / Services**

The threat of substitutes as a feasible replacement for bulk terminals is low. Currently, there is not much evidence that substitutes exist, but continuing developments in international logistics may change this.

Few substitutes for terminals come close to making economic sense. Air transport is only cost effective for high-value or low-bulk items. Railways and trucks can be a substitute for shipping over land to places in North America, but terminals do not consider themselves as competing with land transportation. Container terminal usage is increasing for transportation overseas. By 2020 international container trade will double (Trade and Transportation, I) creating economies of scale that could allow bulk products to be economically transported in containers. However, should the transportation of bulk products in containers become widespread, bulk terminals would likely invest in container technologies to participate, which would lower any impact of this development.

### **2.2.5 Rivalry among Existing Competitors**

There is a moderate to high degree of rivalry between existing competitors in the bulk terminal industry.

Bulk shipping is neither a particularly exciting nor a dynamic industry. Although, over the last few years, bulk shipments have risen above historic trends, for the most part, the industry is mature, with a corresponding slow growth pattern. In order for terminals to grow and increase throughput, tonnage must be taken from existing terminals.

Another factor that increases rivalry is that all terminals offer homogeneous services. Different terminals may utilize a variety of different equipment or operating procedures, but they are all moving bulk material (liquid or solids). With few changes, any terminal that has the capability to transport a dry bulk product can ship any other dry bulk product (products are loaded onto vessels using large conveyor systems). The same is true for any terminal involved in handling liquid bulk products. Since all services are homogeneous, price become the main point of differentiation for many terminals.

There are switching costs involved in changing or adding products. Different products may require special handling procedures such as clean up or contamination prevention measures. These costs can be substantial. The costs may not stop a terminal from going after new business, but they do have to account for these costs in calculating returns and tariffs.

A few factors from the other forces in the model increase rivalry. How a company uses technology to create efficiencies can provide cost advantages for terminals. Space can also increase rivalry by giving certain terminals that have space the ability to cheaply take on more products. The customers that use contract negotiations to compare terminals help to create rivalry as well. A factor that can really affect rivalry is the relationship a terminal has with organized labour. A poor relationship can make a terminal non-competitive.

The factors discussed above point to a high rivalry among firms, however, a few issues decrease this rivalry. While many terminals would like to lure away tonnage from competing terminals, their capacity constraints hinder them. There might seem to be room to increase production from a yield or throughput perspective, but space is an issue (which creates a bottleneck).

## **2.3 Overall Industry Assessment**

Based upon the industry analysis, the bulk terminal industry is attractive for a number of reasons. Although the growth in the world trade of commodities is slow, the pressure from the container industry is helping to shrink bulk terminals capacities. This creates an increase in the demand on bulk terminals. Most of the commodities shipped through the Port of Vancouver are typically essential goods, which is favourable to the industry. For example, wheat, sulphur, and coal are less cyclical than most commodities. Wheat creates food, sulphur creates fertilizer, and coal provides power. These are significantly less cyclical than iron ore, forest products, or chemicals. Regardless of economic conditions, people still require food and heat. The lack of viable substitutes also plays a strong role in providing strength to this industry. In addition, the difficulty in opening new ports or terminals that would alleviate pressure from the existing logistic chain makes the industry even more attractive.

## **2.4 Key Success Factors**

There are a number of key success factors in this industry. The first is cost control. All terminals constantly scrutinize costs. Terminals provide an unbranded homogenous service that is valued by price above all (and then by other attributes, such as reliability of service). While changes happen slowly in this industry, business does eventually shift to the low cost provider as long as that provider meets the basic requirements of its customers.

Labour management is a critical factor as well. It is an ongoing issue, which if not managed properly can severely hamper the ability for a terminal or in some cases the entire industry from operating efficiently. There are only a few solutions to labour problems: either come to a mutually beneficial agreement with the union or eliminate the ability for labour to effect operations. PCT has historically followed the latter method.

Another key success factor is supply chain coordination. There are a number of ways to coordinate the logistics: partnerships, joint ventures, integration, contracts, etc. Regardless of the method used to control the logistics chain, it is important for terminals to lock in volumes. This allows greater stability and planning in the logistics chain. It also promotes better forecasting and budgeting.

### **3 INTERNAL ANALYSIS**

PCT competes on a cost-based strategy with an overriding goal to obtain the lowest cost possible while maintaining adequate levels of productivity. Managers' incentive plans contain quality and productivity objectives, which ensure that cost saving measures do not adversely affect terminal performance. Cost savings are almost exclusively attained through economies of scale and by incremental improvements in processes.

#### **3.1 Strategic Fit**

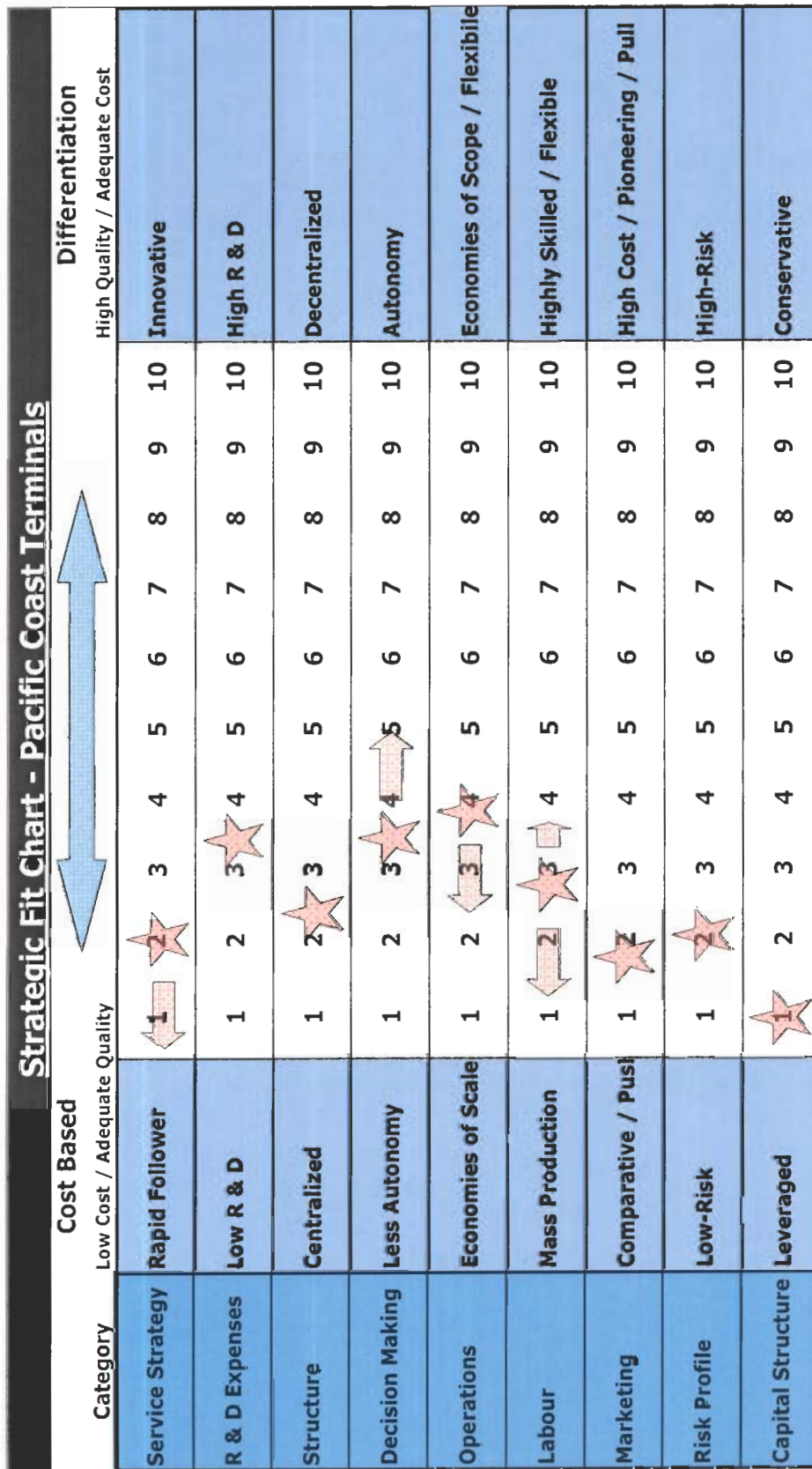
Below is a strategic fit chart for PCT (figure 6). For each variable, the stars denote the present location of PCT's strategy and the arrows indicate forces that are moving the company. These forces can originate from within the company or from external sources beyond the company's control. An analysis follows each variable explaining where and why it places on the scale. A brief discussion follows on how PCT's placement in these categories aligns with its overall corporate strategy.

##### **3.1.1 Service Strategy**

PCT service strategy fits well into its overall cost-based strategy. PCT operates in a mature, stable industry. It is difficult to be innovative when the main goal is to reduce costs. How can bulk commodities be transported, if not by train and ships? How can it be stored and loaded, if not in piles and conveyors? This does not suggest that innovation does not exist. It means that innovation does not strongly influence the core business structure of the company. Most of the innovation that occurs is behind the scenes and is not apparent to customers.



Figure 6 - PCT Strategic Fit



(Source – Adapted from Bukczar 2005)

PCT provides the bare minimum service level that meets its customers' needs. For example, PCT does not do inventory calculations, testing of the sulphur, or vessel draft surveys. This can cause problems because there are times when customers or other third parties (contracted by costumers) require extra services or special requirements. PCT is hesitant to comply as it views any extra services as outside of its mandate and does not want the burden of performing these extra tasks.

Service improvements that do occur are mostly to provide more timely and accurate information that provide better feedback on operations allowing the customers to accurately plan their own operations or allow PCT to reduce costs.

### **3.1.2 Research and Development Expenses**

PCT has a strong competency in R & D, though it would be misleading to say that it spends a lot on that area. PCT does little actual research and development, in the traditional sense. Most of the R & D expenses go towards exploring new technologies and their application towards processes. Usually this means finding new ways of adapting existing technology to PCT's operations. For example, PCT is investigating the use of wi-fi technology. The goal of wi-fi is to enable personnel to enter data and report problems remotely. This technology would allow quicker responses to problems and eliminate redundant jobs that only transfer information, thus reducing downtime, and lowering costs. Wi-fi technology is being used around the world, but it is a new technology in the mature port industry (e.g. the Port Authority did not have email until 2001).

There are constant discussions and studies regarding automation projects. R & D can be construed as being high relative to PCT's strategy. However, the ultimate goals are too improve efficiencies and lower costs.

### **3.1.3 Structure**

PCT's structure is very centralized. All of the operational decisions come from a small group of individuals that oversee the day-to-day operations and long term planning of the terminal. This allows PCT to reduce the costs and time involved communicating along the chain of command. It also allows the chain to be broken easily when needed. If necessary, a clerical level position can speak directly to an executive level position to convey a concern or idea. All levels of non-union employees attend weekly operations meetings that allow flows of information to move up and down the company's hierarchy. Informal transfers of knowledge occur during lunches, coffees, etc. This helps higher-level positions get a feel for developments on the shop floor and it allows lower level employees to understand the workings of upper management. This closeness allows staff members to fill in for each other if needed (e.g. the purchaser can chair the daily maintenance meetings with foremen).

A problem with the structure occurs because of the customer/owner issue. Decisions imposed upon PCT can be contrary to its normal strategic operating parameters. These instructions can include handling high cost products (while charging the same price) or moving operations to a high-cost shift from a low cost shift to load a vessel or unload a train. These edicts can be confusing and frustrating to the management team because it is such a departure from the company's normal business practices. Although, there are usually very good reasons for these actions (improve end customer relations, bottlenecks elsewhere outside of PCT's and Sultran's horizon of understanding), that PCT is not privy to. This alludes to a lack of communication between the companies.

### **3.1.4 Decision Making**

Currently the majority of the decision-making processes at PCT have a low level of autonomy, which aligns with the cost based strategy. Even decisions that appear autonomous on

the surface are made within a set of strict parameters. These parameters favour low costs and other efficiencies. This has caused a few problems at PCT. The management of PCT is skilled and comes from a diverse set of backgrounds. As a result, internal discussions can provide optimal alternatives that are contrary to the official parameters. Even if these alternatives further the overall goal of lowering costs, they may be disregarded because the official policy makers did not create them. There have been incidents of tension over the increasing desire for autonomy by PCT management. This has the potential to reduce cohesion between PCT's and Sultran's management groups (although it currently has not done so).

### **3.1.5 Operations**

Economies of scale are central to PCT's success. The costs of capital equipment, waterfront taxes, and land leases are expensive. The throughput that is required to maintain break-even volumes is quite large. The break-even volume was approximately 93% of the actual volume in 2004. PCT does not have to lose much throughput before it begins to lose money. For example, the company suffered losses in 2001 while shipping almost 77% of 2004's volumes. Maintaining economies of scale are important to successfully keeping costs down.

The equipment and layout of the terminal is hard to change. It would be difficult for PCT to ship other bulk materials on the same equipment or entirely new products because of cross contamination concerns. Any new product would require new capital expenditures and the installation of entire process systems.

Automation is a key component to PCT's operations and is central to its strategy. It provides more payback than any other single development. Automation allows the streamlining of operations to be more efficient and less costly. It eliminates the causes of inefficiencies, whether that inefficiency arises from poor scheduling, equipment designs, or even human error. Automation helps economies of scale in two ways. First, it allows more productivity per unit of

time and allows the movement of more product. Second, since it lowers costs, it lowers the volumes needed to achieve the same economies of scale that would occur without automation.

In addition to economies of scale, automation allows the simplification of tasks for the average employee. While training increases for a few personnel who maintain the automated equipment, the tasks are easier for the majority of personnel who use it. For example, instead of operating joysticks, dials and buttons on a huge control board, employees only need to click a mouse button and monitor the system.

### **3.1.6 Labour**

Similar to operations, labour relies on mass production. The main thrust of PCT's low cost strategy is to reduce labour expenses, which is PCT's single largest expense. The current system promotes on a seniority basis, which has caused the skill level to drop in the union ranks. For example, a few years ago PCT initiated a trade apprenticeship program. Instead of the typical apprentice demographics with an average age of 20, most of the apprentices were in their 50's because the apprentice program was assigned to individuals based on seniority. As a result, the company abandoned the program because it had no interest in training apprentices that would retire shortly after completing the 4-year program. Another problem has been the hall dispatch system and the transitional nature of the workforce. It is very easy for union members to book off at will or work on erratic schedules. The company never knows the exact personnel that will make up its workforce each day. If a skilled employee works on a given project, he or she can be replaced the next week with someone else out of the "hall" without the same desired skill set. Inadvertently, the union has assisted PCT in lowering costs because it has forced it to compensate by automating processes that reduce both the amount of jobs available and the skill levels needed to fulfil the remaining jobs. When possible, PCT outsources any project or job that requires any specialized skill and allows the union to perform only those jobs laid out specifically in the

collective agreement (operations and “regular maintenance”). PCT has reduced the labour force by approximately 45% over the last 7 years. The labour cost per tonne shipped and the tonnes per man-hour worked have steadily improved, as shown in table 3 below.

**Table 3 - PCT Labour Productivity**

<b>PCT Labour Productivity</b>					
<b>Productivity:</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
Labour Cost per tonne	\$1.98	\$2.03	\$2.12	\$2.23	\$2.29
Tonnes per man-hour	33.22	31.43	29.58	27.52	25.28

*(Source: Leslie)*

Unfortunately, this also has a small negative side effect. The technology used to reduce and simplify jobs has required an increase in the skill of the people maintaining the complex technology. Although this acts counter to the overall strategy, the gains from labour savings outweigh the losses. This creates a constraint on PCT as well. Replacing the variable costs of the union workforce with the fixed costs of technology restricts the company’s flexibility and changes its operating strategy to focus even more on economies of scale.

Ordering of labour occurs through a hall dispatch system. As a result, labour is only ordered when the need arises. If no operations occur, the only labour required is a skeleton crew of workers and the management team. The variable cost is approximately 62% of total costs. Since the entire industry operates with this same labour model, PCT maintains a relatively good placement along the operations spectrum.

### **3.1.7 Marketing**

Since PCT’s customers are also its owners, most of the typical marketing functions are not applicable. Any marketing that PCT undertakes is push marketing. Sultran also ships sulphur through another terminal in the Port of Vancouver to maintain a redundant system in case of service interruptions. PCT is constantly comparing the throughput statistics and costs between the two terminals (as well as other bulk sites). PCT has not excelled at attempts at pull

marketing. There have been a few cases when PCT has tried to find other customers. This has not met with a great deal of success.

### **3.1.8 Risk Profile**

Although PCT operates in a mature industry, it is not declining. Oil and gas production is running at full speed with new sources coming on line or being planned (e.g. tar sands). PCT may compete with other logistics companies but the main producers/owners have a stake in shipping through Sultran and PCT. These factors lead to a low risk situation. As mentioned above, there are always risks, but relatively speaking, PCT's exposure to systematic and non-systematic risk is low.

### **3.1.9 Capital Structure**

The capital structure of PCT is simple and straightforward. The owners hold a nominal amount of capital stock to ensure full control over PCT. Otherwise, PCT is completely funded by debt with all retained earnings invested back into the company or paid to Sultran as dividends. This allows PCT to maintain a low cost of capital that contributes to its low-cost strategy.

### **3.1.10 Strategic Fit Conclusion**

PCT has done an excellent job following its corporate strategy. For example, nominal costs per tonne are approximately 50% less than what they were 20 years ago. Taking into account inflation the improvement is even more impressive. Some of the difference may have to do with the increasing volumes shipped through the terminal, which is beyond PCT's control, but the majority of cost savings have come from PCT's adherence to its own cost based strategy.

PCT excels in R & D and labour management, both of which focus on cost reduction and contribute the most to making PCT's strategy successful. PCT handles cargo at a fraction of the cost of other terminals. PCT's control of labour, the costliest and most unpredictable area of

operations, reduces costs and increases production efficiency by creating a simplified system for the average user.

PCT also has some weaknesses with its strategic fit. PCT tends to spend too many resources on research and development. Using technology to reduce costs is a good strategy, but there is a tendency to perform R & D on non-core processes, or push through less than optimal projects. This is not an effective use of funds. R & D is exciting; as a result, there is a natural propensity to spend more resources than necessary on it. Steps should be taken to prevent this from occurring.

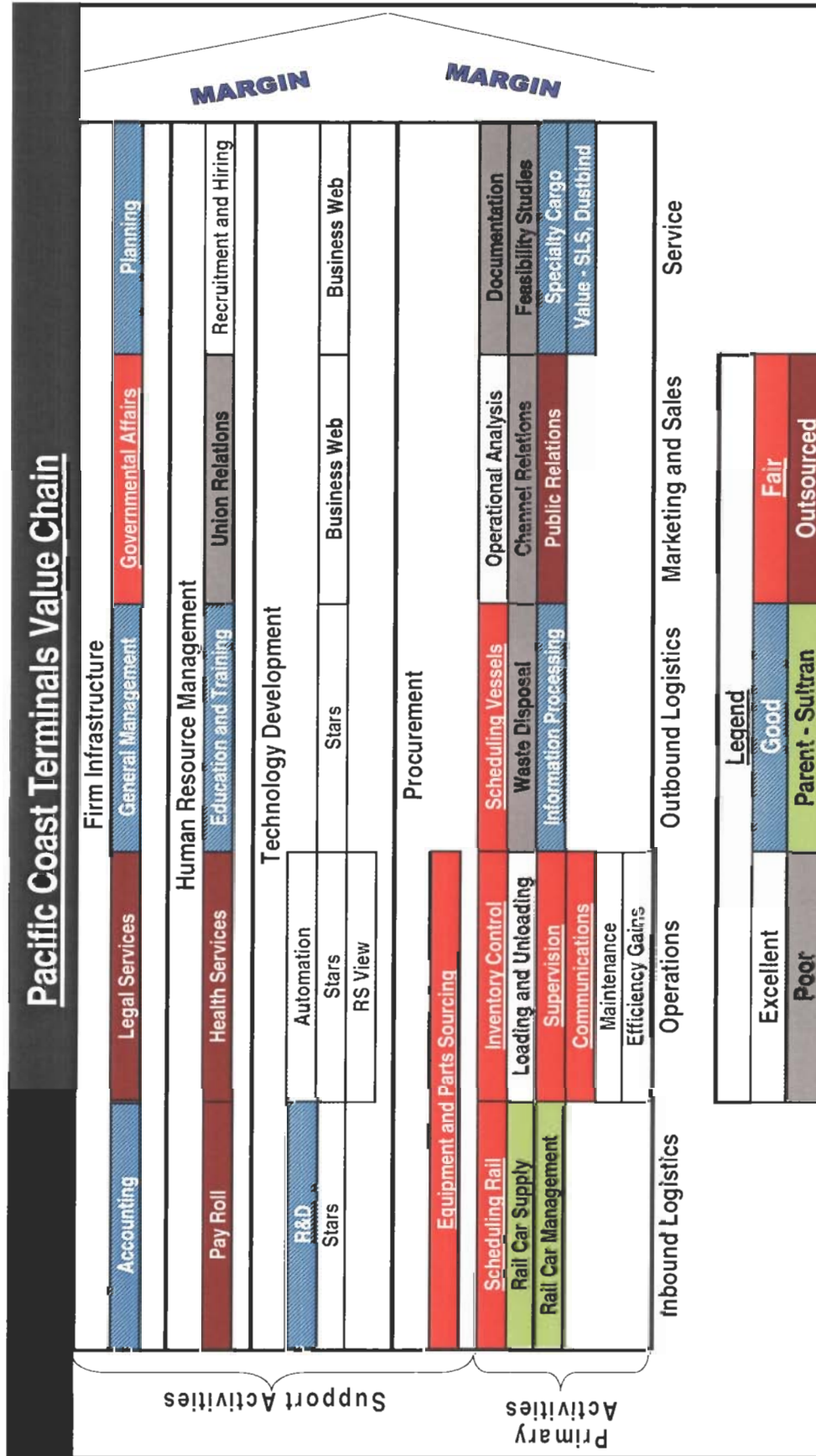
PCT management also is pushing for more autonomy, which is contrary to PCT's overall strategy. This is the only area where management is actively trying to move away in the opposite direction from the cost-based strategy. This occurs because PCT's staff does not fully understand the ramifications of moving obtaining more autonomy. Increasing autonomy will raise costs and decrease the competitiveness of the terminal.

### **3.2 PCT Value Chain**

Pacific Coast Terminal's value chain is shown in figure 7. To provide insight into the activities at PCT, here is an example of the typical process that occurs. A few weeks before a vessel arrives, PCT begins to receive daily updates of the estimated time of arrival (ETA) of the vessel. As the vessel gets closer, the producers and customers solidify the type and quantity of cargo to be loaded. Train arrivals are updated on a daily basis as well. Constant communication occurs between Sultran, vessel agents, union employees, third party contractors (that perform various duties), the railway, and the various departments within PCT itself. This communication provides all stakeholders with the updated schedule, which frequently changes, so that they will know when each of them is required to perform their duties. For instance, union operations, maintenance, or third parties or a combination may be required. The contractors that test the



Figure 7 - PCT Level Value Chain



(Source: Adapted from Porter 1985)

holds of the vessel are needed during the beginning of operations. As well, the maintenance department needs to know when equipment is free so that maintenance can be performed. This process continues while the trains and vessels are at PCT. This continuous process does not have a pattern to it. The only certainty is that the schedule will change, as it is only accurate about 12 hours before an operation is set to commence and even then, changes can occur hours before operations are set to begin.

Looking at the functions from a macro perspective, they seem rather simple. However, train schedules are constantly changing. Trains have to contend with loading problems at the plants, derailments, landslides, rail congestion, locomotive shortages, inventory levels, and labour issues. Vessels face similar issues. Vessel deviations occur because of coast guard inspections, hold inspections (for product quality assurance), head or tail wind changes, loading plan changes at other terminals, cargo issues (contractual obligations between marketers) and tide restrictions. Most of these issues are out of PCT's control and can change multiple times during a single day. As train and vessel changes occur, PCT operations are altered to meet the new schedule. The function of obtaining updated information and altering operations can take a large amount of time.

### **3.3 Primary Activities**

Primary activities comprise the basic functioning of the company. These activities are divided into five categories (inbound logistics, operations, outbound logistics, service, and marketing and sales) and are described below.

#### **3.3.1 Inbound Logistics**

Activities begin when oil and gas is refined and sulphur is recovered or glycol is produced. Since sulphur is a waste product, companies want to minimize its disposal costs. The

more it is handled the higher the costs. Therefore, the scheduling of railway transportation is important in reducing total costs. If rail cars are unavailable then the sulphur must be stored at the refinery, driving up costs. Sultran, PCT, and the railway companies hold daily conference calls to determine scheduling and to foster communication between the parties, as any breakdown in communication can lead to delays and higher costs.

Sulphur and glycol production occurs on a regular basis. Even though the production of sulphur and glycol is easy to manage, difficulties arise when the sulphur leaves the plant. As discussed earlier, frequent bottlenecks occur with such little warning that managing the inbound logistics is a difficult job. Complicating the process are separate groups that control different stages in the process. It is typical for PCT to be informed of a late train only hours before it is due to arrive on site. There are many instances where the terminal has a full labour order, but is sitting idle, waiting for a train to arrive.

PCT's input into scheduling is based upon its own limitations and capacity. It only has a fair competency in this regard because of its short sightedness. PCT only starts to solidify its schedule when the railcars are a day away from the terminal. This can lead to surprises that can hamper the terminal as well as its customers. For example, maintenance disruptions occur when a train unexpectedly arrives that Sultran wants unloaded. A longer view might alleviate this problem.

In order for the above to occur, rail cars must be managed and supplied by Sultran, Dow, Shell, and the railway companies. The supply and management of the cars is important because sulphur and glycol can only be shipped in specially reserved cars. Issues of cross contamination (for example with coal) and corrosion require sulphur to have its own railway cars. Many logistical problems originate and solved in this area. For example, the mitigation of bottlenecks occurs if enough cars are available to keep operations from stopping. On the other hand, too

many idle cars can create higher costs to the company in capital and operating expenses.

Currently, the train use is efficient enough and there is enough slack in the system that minor delays do not adversely affect any stakeholders.

### **3.3.2 Operations**

Operational activities are the core of the company and take place on site. PCT personnel oversee all of the activities, as outlined in the diagram. In general, the performance of operations activities is done very well and adds a considerable amount of value. PCT runs two parallel operations: sulphur and glycol. Each operation has very little impact on the other. Once the schedule is determined, the manager on duty relays the operating plans to the foremen, who then orders the appropriate labour and begins any set-up needed for operations (general information transference).

The primary function is the unloading and loading of sulphur. Sulphur is unloaded from railcars and loaded onto vessels for export. During the year, PCT unloads approximately 450 trains made up of 80 to 119 cars each. Over 45,000 rail cars of sulphur are unloaded each year. Sultran owns a set amount of railcars and maintains an optimum schedule and turnaround goal for the trains, however, because of the variances involved (e.g. locomotive availability, rail congestion) the arrival of trains can seem random. The number of trains is large enough that train unloading occurs on a consistent basis. It usually takes about 6 hours to unload a train; due to railway switching no more than one train can be unloaded in any single shift. Unloading of rail cars occurs at a rate of approximately 2,000 tonnes an hour. All of this sulphur is loaded onto over 120 vessels a year. Vessels are subject to world markets. After a transaction, the buyer or seller will hire a vessel to transport the product. Sulphur transactions occur on a regular basis, but because of the variances (e.g. different bulk products vying for vessels, buyers and sellers trying to time the market) vessels appear to arrive randomly. One berth is dedicated to sulphur vessels.

Vessels are owned by various multi-national companies and are represented locally by vessel agents who interact with terminals, ship supply companies, etc. Loading a vessel can range from a single shift to three days depending on inventory and the quantity loaded. The sulphur loaded on a vessel can range from 4,000 tonnes to 70,000 tonnes, with the average vessel taking about 45,000 tonnes. Vessels range from 465 feet to 790 feet long, the largest vessel being in the Panamax category. The loading rate varies from a low of 3,500 tonnes per hour to a high of 5,000 tonnes per hour during dual source loading. PCT stores sulphur in three windrow plies (for the different sulphur types) with a storage capacity of 220,000 tonnes. The space available for inventory is constrained by the size of the parcel of land where the site is located.

Table 4 contains the minimum labour requirements, as per the collective agreement.

**Table 4 - Sulphur Labour**

<b>Standard Labour Per Shift - Sulphur</b>				
<b>Shift Type</b>	<b>Maintenance Employee</b>	<b>Maintenance Foremen</b>	<b>Operations Employee</b>	<b>Operations Foremen</b>
<b>Week Day</b>	14	4	0	1
<b>Week Night</b>	4	1	0	1
<b>Weekend</b>	0	0	0	1
<b>Train Unloading to Stockpile</b>	5	1	6	2
<b>Ship Loading from Stockpile</b>	5	1	4	2
<b>Train direct to Stockpile</b>	5	1	8	3
<b>Dual Source</b>	5	1	8	3

*(Source: Leslie)*

There are three items to note in the above table. First, any time operations take place two operators are employed to operate one machine. The first operator works four hours then hands off the equipment to the second operator, and is then free to leave, thus working four hours and paid for eight. This is done as per the collective agreement to ensure uninterrupted operations. These two operators do not take a coffee or lunch break during their shift. Second, the Chair Foreman is the only operations foreman on duty during the non-operating shifts. The Chair Foreman performs the actual ordering of labour, line calls, coordinating loading plans, etc, as directed by a PCT manager. This foreman is also required during operating shifts. Foremen are the only people who can direct ILWU 500 members to perform work. Depending on

circumstances, more labour can be ordered (and usually is) as needed by PCT management. Third, combined shifts can reduce duplicated labour. For instance, if dual source operations occur during a weekday then the four foremen already employed on the weekday will cover the one maintenance foremen required. However, if a dual source shift occurs on a weekend the maintenance foremen must be hired specifically for that shift.

Based upon the operating requirements, five operating conditions exist at PCT. No operation is used for clean-up or maintenance, or nothing. The labour requirements on these shifts stem from the jobs that management requires. Clean-up and maintenance can occur on operating shifts as well, with the only constraint being that moving equipment must be avoided. Unloading from train to stockpiles occurs when only a train is available for unloading, and no vessel is on the dock, or the product in the train does not match the cargo requirements of the vessel. Trains usually take priority over vessels. Sultran owns the trains and the company incurs a contractual cost when they are late. Vessels on the other hand, may incur a cost for sitting idle at the berth (this is understood as a cost of doing business); however, this cost is not borne by PCT or Sultran. As a result, a train will be unloaded while a vessel sits idle. Ship loading from the stockpile occurs when no train is present, but a vessel is being loaded from the stockpiles. Dual source occurs when a train (which meets the product type requirements of the vessel) and a ship are present and inventory matches the cargo requirements. The product in the train goes directly to the ship and is combined with product from the stockpiles. Dual source shifts are the most productive for PCT for a number of reasons. First, the product from the train avoids dual handling. Second, the loading tonnage per hour increases from an average of 14 to 15 thousand tonnes a shift to around 22 to 25 thousand tonnes. Third, there is a reduction in labour requirements. If a train is put to stockpile and then loaded (on a separate shift) from the stockpile to a vessel four foremen are required, however, dual source shifts require only three foremen. The duplicated Chair Foreman is eliminated.

The real value (or cost savings) that occurs at this stage comes from the automation of the unloading and loading functions. Twenty years ago, rail cars were pushed around the site using front-end loaders. Every piece of equipment was human operated with human supervisors watching human operators. Currently, many of the operations are automated. Rail cars are no longer pushed around the site with front-end loaders, but instead are “indexed” car by car through an automated dumper by a large metal arm that moves on a track. This arm grabs the knuckles of the railcars and moves them through the dumper. Similarly, the sulphur that is stored on site is stacked and reclaimed by a custom made piece of equipment, called a StakRake, which requires no operators or supervisors. The StakRake receives commands through inputs given to other machines. For example, if the operator on the ship loader selects a certain material to be loaded, then the StakRake programming will determine what material to reclaim to the vessel based on the request from the operator.

The secondary product shipped through PCT is glycol. The operations of the glycol division are much simpler than sulphur operations. No maintenance personnel are required, because there are very few moving parts compared to the sulphur side. The labour required, as per the collective agreement for glycol operations is seen in table 5.

**Table 5 - Glycol Labour**

<b>Standard Labour Per Shift - Glycol</b>		
<b>Shift Type</b>	<b>Operations Employees</b>	<b>Operations Foremen</b>
<b>No Operations - Week Day</b>	0	1
<b>No Operations - Week Night</b>	0	0
<b>No Operations - Weekend</b>	0	0
<b>Train Unloading Only (1-20 Cars)</b>	3	1
<b>Train Unloading Only (21-39 Cars)</b>	4	1
<b>Ship Loading Only</b>	4	2
<b>Train Unloading and Ship Loading</b>	5 or 6	2

*(Source: Leslie)*

The rail unloading process has different labour requirements depending on the number of cars unloaded. Dow trains arrive with 78 cars and are unloaded over two shifts at 39 cars per

shift, which is the maximum number of cars PCT can unload at any one time. Shell cars arrive in smaller lots attached to other non-glycol trains. Once enough units have accumulated, they are unloaded. Shell cars are unloaded 20 at a time because of how the car configurations line up with PCT's unloading stations and to minimize labour, as even unloading one more car would require an extra person and PCT cannot fit 39 Shell cars on its tracks to justify that extra employee. Dow cars hold approximately 86 tonnes of glycol and Shell cars carry 95 tonnes each. Dow was the first customer at PCT and as a result, gets priority on which shifts to unload (and usually chooses the lower cost day shifts), Shell can unload during all other shifts. The volume is such that most unloading occurs during the lower cost weekday shifts.

All of the railcars are manually hooked up to hoses and then simultaneously unloaded. Glycol is pumped out of the railcars into storage tanks at a rate of 1,200 tonnes per hour, taking an average of five and a half hours to unload.

There is one berth dedicated to glycol vessels, which has no influence on sulphur operations. The 75 glycol vessels loaded each year range from a dead weight of 9,000 tonnes to a maximum of 30,000 tonnes and range in length from 435 feet to 605 feet. Vessels are manually hooked up to hoses and are loaded at a rate of 500 to 950 tonnes per hour, depending on the vessel requests. Due to the complexities of the loading process, it is very difficult to stop loading until the vessel is complete. Loading operations continue around the clock until the vessel is completely loaded. There are no "direct-hits" as in the sulphur operations, all operations must go to or from the storage tanks. Savings take place with two operations occurring simultaneously because the number of operations employees is less than the sum of the separate operations.

A large amount of cost savings and efficiency gains have arisen from the automation of historically human operated equipment. Efficiency gains occur because human error causes most of the downtime. People are either unfamiliar with controls (through limited use) or purposely



sabotage operations because of hostilities towards the company. Either way, the removal of an operator increases the availability and throughput of the machine. Removing operators has an added advantage as substantial cost savings accrue rapidly. Removing the operator and supervisors decreases the labour cost appreciably. Savings in the first year of the StakRake automation reached half a million dollars in labour costs alone. Also, because of the reduced wear and tear on the machine (the automated system lessens the harsh operating requests that humans can impose; such as requesting multiple motor starts within a very short period of time) maintenance costs (labour, parts, and downtime) are lower.

While the automation has helped with maintenance, the maintenance activity itself adds a lot of value to the company. PCT uses quite an extensive maintenance system. The core of maintenance is the computerized preventative maintenance system. This consists of a series of computer scheduled observations, inspections, tests, and replacements done at regular intervals on all equipment. The goal is to discover a problem before it causes downtime (for example, a the frequency of vibrations of a motor can determine if there is a crack in the motor shaft or even if there is a problem with a gear in a gearbox the motor is hooked up to). The ability to find a problem before it impacts operations contributes significantly to terminal availability. Another important aspect of maintenance is that when a problem does happen, the maintenance staff either designs the flaw out of the equipment or puts procedures in place so that the problem does not occur again. While other companies can easily replicate this maintenance function, the dedication and effort that the PCT maintenance department devotes to its preventative maintenance program provides extensive value to PCT.

Another activity that PCT performs, although very informally is inventory control. As PCT does not take ownership of any product, inventory is not a specific task that is required but it helps make the operations go smoothly. Sultran is the ultimate owner of the inventory control activity. However, because of the delay in information transference and the fact that Sultran is

located off-site, at times PCT has the ability to manage inventory more effectively than anyone else. The fact that PCT is owned by Sultran is advantageous in this instance. PCT fills in the information that Sultran either lacks, or is incorrect. PCT staff uses their tacit knowledge about inventory to provide this information. Sometimes all it takes is for a PCT manager to look out the window, review the stockpiles, and tell Sultran that there is not as much product in inventory as the data indicates. This can help in the scheduling of rail and vessels, which can save entire shifts.

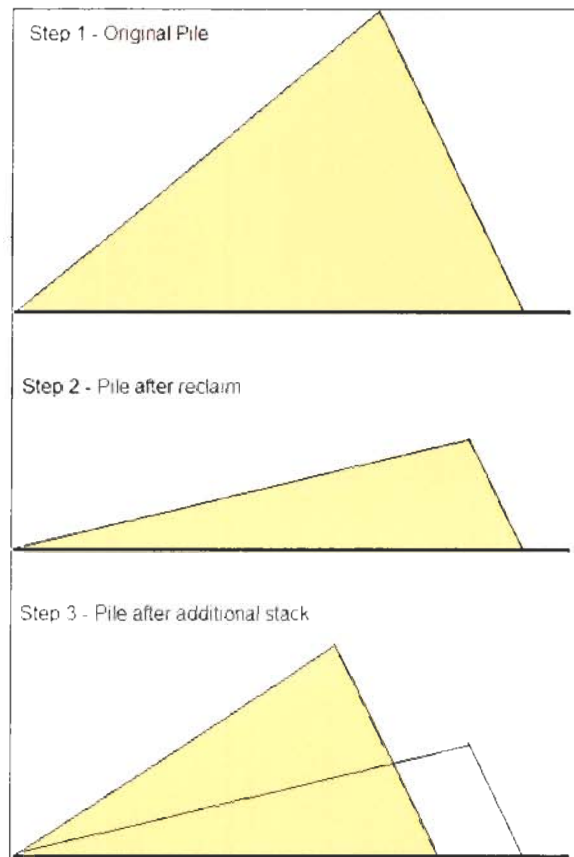
The difficulty experienced in inventory control deserves a closer look. There are a few problems in the current system such as delays in data, scale errors, waste, and programming issues. The real data has a time delay that lags reality by a week or more. Estimates can compensate the lag; however, it does not solve the problem. Tonnage measurement occurs at many points in the system: when it leaves the plant, during transfer at PCT, and during surveys of the vessels. These measures rarely match each other. The plants determine the official incoming total when they load product on trains and the final survey of the vessel determines the outgoing total when loading is complete. The percentage differences between the measurements are not large, but when dealing with large tonnages it means tens of thousands of tonnes missing per year. The waste or spillage that is unaccounted for creates problems for the inventory department. Sulphur is lost at transfer points, at the plows that remove water, over storage pile walls, etc. While the spillage is taken and placed in an “off-spec” pile, it is not taken out of inventory calculations. Inventory calculations use the sulphur’s natural angle of repose<sup>2</sup> and the angle of the StakRake booms. Depending on the operations (stacking and reclaiming) this method can arrive at erroneous results. Figure 8 shows how the program calculates tonnage in the stockpiles. The yellow in the figure shows what the program calculates as tonnage in the pile.

---

<sup>2</sup> Angle of repose - the inclination of a plane at which a body placed on the plane would remain at rest, or if in motion would roll or slide down with uniform velocity; the angle at which the various kinds of earth will stand when abandoned to themselves.

The figure below shows the side profile of the stockpiles in an exaggerated manner for effect; however, the tonnage differences between actual and estimated can be significant. This is the largest cause of errors between actual and estimated tonnage on the ground.

**Figure 8 - Inventory Pile Calculations**



*(Source: Leslie)*

Although the inventory discrepancy can cause problems during operations, it is the opinion of Sultran and PCT management that the additional programming required to fix the causes of these discrepancies is not worth the cost. The extra costs and resources spent on calculating inventory (e.g. employees estimate tonnage of spillage cleaned up to enter into the program) in a new system does not justify the perceived small inconvenience of Sultran phoning a PCT manager and asking what their opinion is on the inventory. The differences are acceptable

and manageable. Sultran and PCT view sulphur as a waste product anyway; therefore, no losses are incurred by an inaccurate inventory system.

PCT engages in operational analysis. The analysis is a strong point. Configuration of the information systems provides a wide range of tailored feedback. This information is then used to perform self-evaluations on operations. The staff at PCT performs weekly evaluations of their performance and evaluates what was done right and what can be improved upon. These insights allow improvements to equipment and procedures that can increase productivity and decrease costs.

Other activities include supervision and communications. These activities are conducted adequately, but could be improved. Supervision entails the management of workers and ensuring they perform their job correctly. At times, this may require assisting employees in performing their jobs or coordinating work. PCT focuses a large amount of time and effort on this activity, yet experiences few gains from it. A number of factors contribute to this. The work environment is highly unionized and the union has fought PCT on many of the implemented changes over the years. For example, the union sees the automation of the StakRake as a loss of jobs not as increasing efficiency.

In general, PCT suffers from a very poor labour relations environment. At times, this environment causes micro-supervision and seemingly heavy-handed tactics by management. This only adds to the cycle of distrust between management and the union. The supervision is adequate only because so many procedures and memos force the employees to perform their duties “as per procedure” which allows the company to discipline them if the procedures are not followed. While this tactic works, it has drawbacks. It creates employees that are unable to think outside the box and handle special cases. It also forces the company to discipline a well-meaning employee who makes a mistake the same as an employee who is consciously trying to sabotage

operations. Any difference in discipline by the company immediately creates questions of favouritism and jeopardizes future disciplinary action (past practice issues). Another drawback is that it is impossible to cover every situation that an employee may encounter in a procedure booklet. That being said, waterfronts around the world face the same hostility from labour and so this issue is not a competitive disadvantage to PCT. If any product leaves North America by deep-sea vessels, the same militant union will handle it. Some firms have better relations with the ILWU, but there is usually some degree of hostility between any company and the union.

### **3.3.3 Outbound Logistics**

Outbound logistics consist of coordinating outbound vessels and information processing of operations.

PCT, Sultran, and vessel agents (representatives of the vessel owners) plan the outbound logistics of vessels. A number of factors restrict vessels, such as operations required at other terminals, draft restrictions, and tide levels. When it is determined that a vessel will leave the terminal, PCT orders “lines”, which is a term meaning the ordering of labour and equipment (e.g. tug boats, crew) that enable a vessel to arrive or leave the terminal. This activity is important to the smooth flow of operations, because the outflow of one vessel enables the inflow of another vessel at PCT’s berth. While this activity seems simple, coordinating and moving vessels that can reach over 700 feet in length and can hold up to 70,000 tonnes of sulphur is difficult and time consuming.

Information processing is a fluid process that involves providing information back to the customer. It includes information such as what rail cars were dumped, what product and tonnage were actually loaded onto vessels, and what time railcars arrived and departed from the site. The information is of limited use to PCT, but all of this information is important to its customers for purposes of monitoring contractual obligations and invoicing purposes. Most of this information

is obtained through control and information systems at PCT and is passed on manually to customers. This could be automated to simplify and speed up the information transference process (it still may need to be checked or verified by a PCT employee).

Waste disposal is also a concern at PCT. Sulphur shipped through PCT is 99.97% pure. To ensure purity, PCT disposes of any sulphur that might have become contaminated. Sulphur is put into “off-spec” piles if it falls out of the system (i.e. falls off a conveyor, spills from a chute, etc.) This waste product is then stored on site, until enough of it accumulates so that it can be disposed of. The disposal usually takes the form of landfill for site remediation at mine sites. This is an expensive process that can cost 10 times the normal cost of logistics. Cost is not the only concern. Because sulphur is bright yellow, any sulphur that does spill is obvious to staff and the public (who may drive past or tour the facility), which can create a public relations problem. Most of this “off-spec” meets the purity requirements of PCT’s customers, but in order to be conservative it is all deemed “off-spec”. Improvements could be made in this area. Although management tries to avoid spillage, more effort can be spent on this task. An R & D project could look into finding ways to reduce spillage. One area that PCT is performing research in is the re-introduction of off-spec material into the stockpiles. As mentioned earlier, much of the spillage meets the purity requirements of customers. However, evidence proving that it meets the required purity level is required. PCT is looking at methods of filtering this material and having it tested for purity and, if it meets the purity requirements, getting authorization to re-introduce the sulphur into the stockpiles. This is in the first steps of implementation. Substantial cost savings will occur if spillage can be reduced and a portion of the spillage that does occur can be re-inserted into inventory.

### **3.3.4 Marketing and Sales**

PCT is wholly owned by its customers and does not require a great deal of marketing. A few minor activities fall under marketing and sales.

PCT engages in some channel relations. The term channel refers to the different stakeholders in the entire logistics chain. Channel relations usually take the form of tours, lunches, etc. Besides interaction with Sultran and its direct owners, PCT's interaction with other stakeholders is limited. Although many of the players in the logistics chain have no power or direct influence over PCT, the company should maintain good relationships with them. Deficiencies in this area occur because PCT does not go (or at least very rarely goes) out of its way to assist other stakeholders. PCT may overlook the power that these stakeholders have over those that do have influence over PCT. For instance, if ships agents are treated poorly, over time, they (if given a choice) may opt to avoid PCT, thus driving up costs of shipping and hurting its customers. While these may not seem like immediate issues, PCT should realize that good relationships with all players would only help the company.

Public relations is an area that PCT management believes to be very important. PCT is a heavy industrial company located in a park-like suburb. Consequently, many people watch for infractions (real or perceived) and complain to the company. PCT feels the best method to combat this is to educate the local population on terminal activities. This is an important function and it is outsourced to a professional PR firm that coordinates PCT's public relations activities. Some specific activities include PCT sponsorships of arts and entertainment events in Port Moody and a newsletter that helps to inform the residents of Port Moody of the different dynamics that occur in running a terminal. These newsletters also highlight different people and positions in the company thereby putting a human face to PCT.

### 3.3.5 Service

Many of the services rendered by PCT are done on requests from customers. PCT will analyze the request and if the request is viable, PCT will charge for it as appropriate.

The handling of specialty cargo is an example of a requested service. From time to time customers will ask PCT to load or unload cargo that does not fit into the company's normal framework. For example, PCT has handled sulphur products that have high moisture content with the consistency of mud. Specialty cargo usually has longer load times, slower productivity, long clean-up periods, and causes increased wear on equipment. These factors are taken into account when PCT invoices for these services, but they are done to keep its customers content.

PCT also enhances the value of the sulphur by adding chemicals to its product. PCT adds two chemicals to the sulphur at different points in the process. The first chemical is ACA. The main ingredient in ACA is Sodium Laurel Sulphate, which stops the bacteria that feed on sulphur. The waste left from these bacteria creates sulphuric acid. Applying this chemical stops acid creation and slows the corrosion of vessel holds or any other metal that is exposed to the sulphur. Dustbind is the name of the other chemical applied. As the name suggests it keeps down dust by binding the smaller sulphur particles together into larger particles. This helps suppress dust, which helps the terminal, the vessels, the end users, and anyone else who encounters the sulphur. The application of these chemicals uses a complex system of sprays and injector pumps to apply the chemicals at various points on site. A large amount of capital was spent creating a system where PCT could control and monitor the application of these chemicals.

In the interest of customer service, PCT conducts many feasibility studies. For instance, if a customer wants PCT to perform activities that are outside its usual duties, the company will conduct studies and sample projects to determine if the request is feasible. These studies tend to be ad hoc. However, any customer that does request PCT to undertake a project like this is



advised of the drawbacks and uncertainty involved. This allows leverage for mistakes in these studies. This type of activity does not occur on a frequent basis.

A weakness in PCT's service activities is providing documentation to customers. Although the information and control systems at PCT are state of the art, other systems are not. For instance, if a train is late PCT will bill the customer the cost of employing idle crews. These invoices are done by calculating the tariff from a book of the hourly wages of the different classes of employees and how long they sat idle. This information is then entered into a spreadsheet. A notice is then sent to accounting so that the spreadsheet can be further processed (accounting creates the official invoice). This results in delays, mistakes, and missed billings. Managers can forget about a delay if it is not written down. Another problem with documentation is that poor labour relations has created an environment where jobs that are to be performed must first be written down to conform with proper procedure. Every permutation of an event must be on paper, or the possibility arises of a work refusal by an employee because he or she does not possess the proper documentation to perform the required duties. This situation is being addressed. A newly hired staff person has the responsibility to cull through all existing documentation, organize it, add information as needed, and centralize it for ease of access. While this is beginning to address the issue, the task is large enough that the company will be vulnerable in this area for sometime.

The primary activities are performed in a manner different from those in a typical profit driven firm. At PCT, as in most integrated companies, there is little motivation to sell services and products in the most efficient manner because it does not have to compete for business. PCT strives to be very efficient in some areas, but in other areas, it is lacking. While a percentage of the manager's incentives are linked to productivity, many functions that effect productivity and throughput are not performed at a level that they otherwise would be in a profit driven firm. There is no drive to increase sales (or in this case throughput) because there is no ability to have

any effect on revenue. Sultran makes all of PCT's decisions that would otherwise be decided by the market in a non-integrated firm. For-profit firms have incentives to perform audits; review projects budgets\variances, etc. Integrated firms do not normally perform these activities.

### **3.4 Support Activities**

Support activities are generic in that they are necessary, to some extent, for every company in every industry. There are four main categories: firm infrastructure (which are activities that support the entire company's value chain); human resource management (which includes recruiting, hiring, training and compensation of employees), technology development (which provides tools to complete other activities in a more efficient manner), and procurement (which is the activity of purchasing the inputs that are used elsewhere in the value chain). Each of these four categories will be discussed in detail as they pertain to PCT.

#### **3.4.1 Firm Infrastructure**

A number of activities are related to firm infrastructure. These activities include accounting, legal services, general management, governmental relations, and planning. As mentioned above these activities support the entire value chain and in some cases create the environment needed to perform the company's primary activities.

The accounting function at PCT is relatively straight forward, with one twist. PCT is set up to operate as a cost centre. All costs are broken down to a cost per tonne of sulphur handled. PCT then charges the equivalent rate of these costs to its customers for each tonne they ship. This creates a non-profit atmosphere.

Accounting plays a large role in determining and structuring the costs of the company. Accounting also provides the ability for other departments to monitor their own costs by providing weekly cost reports in areas like labour costs per tonne, maintenance costs per tonne,

throughput, etc. all versus the budget. This allows departments to curtail or modify activities to bring costs back into line before negative variances become too large. Without this important and timely feedback, costs could easily skyrocket out of control. This is core to PCT's cost based strategy. The accounting function performs well and supports the entire value chain.

Legal services, which are outsourced, provide legal counsel to PCT. Much of the legal service comes in the standard form of contract creation and liability mitigation. However, legal services play an important role when combined with the union relations activity in collective bargaining agreement (CBA) interpretation and representing the company in union grievance procedures. One of the main ways that the company creates efficiencies is by reducing redundant or outdated jobs. Even when the union cannot use the CBA to prevent job losses, problems still occur for the company in other areas (e.g. labour shortages from "the hall" occur which prevent or slow operations, etc.), thus lawyers who specialize in waterfront labour relations help the company navigate to arrive at proper resolutions.

General management is a catchall phrase that represents the everyday activities that managers perform to keep the company running. Without strong, knowledgeable management, the system would break down and the company would find it difficult to maintain its cost based competitive strategy.

The compensation plan itself is modelled (not intentionally) on a balanced scorecard methodology. The manager's incentive compensation plan takes into account cost reductions, learning and growth goals, customer satisfaction, and internal process improvements. The majority of these measures are not static and change for each person from year to year, depending on the position and current operating environment.

Management is not specialized. While managers have their own areas of responsibility, most managers can fill in and perform duties of any other manager. This is a conscious decision

on the part of upper management. It provides redundant personnel, but more importantly, it allows managers to perform all of the duties required while “on-call”. All assistant managers are on a rotation where they spend a week on-call every 4-5 weeks. For this duration, they are in control of all operations at the terminal. The managers are responsible for setting operations schedules, assigning foremen to jobs, and coordinating with all stakeholders. All incoming and outgoing information flows through the manager on-call. During the week rotation, that person is “the terminal” to all outside entities. Since the manager is on-call 24 hours a day, he or she performs many of the specific duties that the other managers are responsible for. The ability to understand and perform all duties is very useful. A single person can make decisions without the need for consultations or group decisions (unless so desired). This provides quick information assessment and fast decisions, which is advantageous because delays can cost up to ten thousand dollars an hour.

A drawback of having all information flow through one person is that different managers handle situations differently. Managers perform the same duties with their own idiosyncrasies. Some decisions are not made consistently because managers have different views on how to interpret company policy. For example, some managers allow vessel visitors onto the site if they have a valid reason and identification; others do not allow visitors at all with out prior written consent from a vessel agent or a valid port pass. These differences are experienced around peripheral functions that the company either does not know about or has determined not to be important enough to spend resources to ensure consistency.

Another area that plays an important role is government relations. Many governmental and quasi-governmental agencies have authority over PCT. The ability to stand up to these agencies when their decisions have unfavourable outcomes to the company plays a vital role in creating value. For instance, Human Resources and Development Canada (HRDC) deemed a certain location on site as hazardous, creating work stoppages when people came close to the

area. PCT management felt that the hazardous designation was unjustified when taking into account the nature of the product, the procedures and equipment in place to reduce hazards, and the actual location where the concern originated. After much discussion and numerous studies, the company finally proved that the location in question was not hazardous and thus HRDC removed the hazardous rating. While PCT was successful in this instance, this is a dangerous game when played without the proper tact and strategy. It has the ability to backfire and cause personal vendettas towards the company because, as in the above example, PCT proved a HRDC employee incorrect. However, the company manages this area adequately enough to avoid most of the pitfalls.

As with any company, planning is crucial. PCT has a continuous rolling five-year plan that encompasses future projections, perceived industry changes, and efficiency opportunities. PCT has successfully accomplished this core competency in the past.

Shorter term planning usually stems from the ground floor. All employees are periodically asked about ideas, projects, and equipment that may need to be purchased in the coming years. Depending on the viability, cost, and payback, these suggestions are entered into the budget. PCT must constantly evaluate industry growth projections, technology advances, etc. to ensure that it can continue to improve costs and productivity. Financial analysis for projects is simple. PCT uses a payback method to determine how long a change will take to recoup its investment. Short-term planning provides the basis for the formation of longer-term planning. The longer-term planning comes from management brainstorm sessions. Ideas that come up in brainstorms or through everyday conversations are evaluated against the goals of the company. Once a direction is established, it enters into the long-term plan through progressive steps as appropriate.

### **3.4.2 Human Resource Management**

Pacific Coast Terminals employs few full-time people relative to its size. Ordering of most of the workforce occurs on an as-needed basis out of a union “hall” as directed by the on-call manager. Therefore, the issues of primary importance to PCT are union relations, union education and training, and union management. In addition, PCT is active in payroll, health services, recruitment, and hiring.

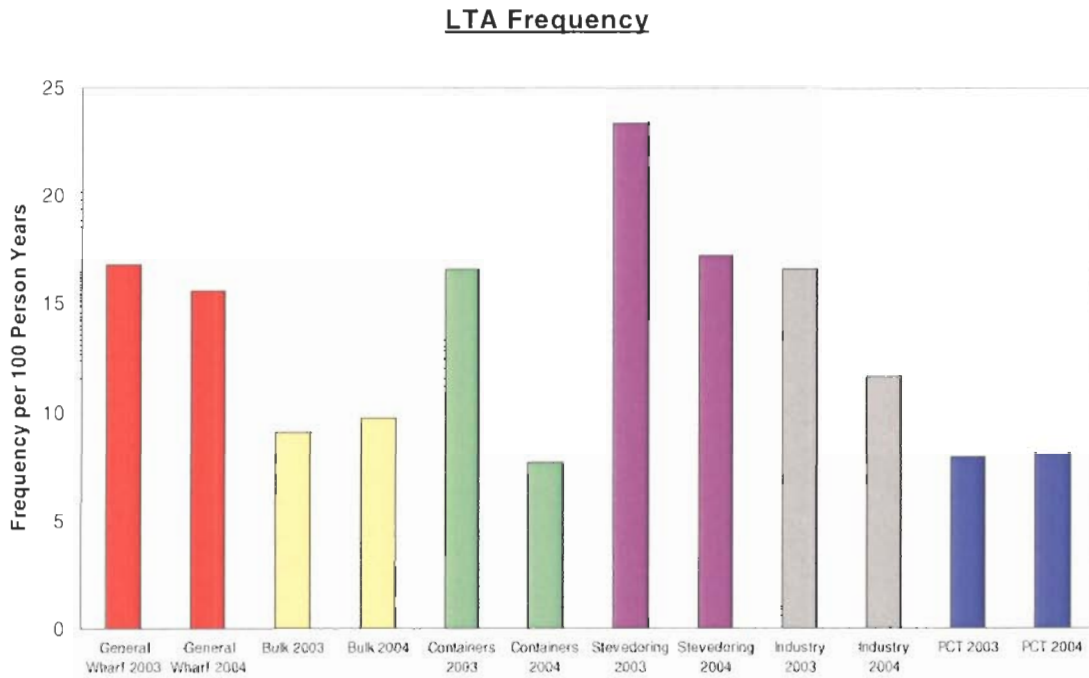
Union relations have been discussed earlier in this paper. Unfortunately, even with the extreme importance of the union to operations, PCT has a poor relationship with the union. As a result, the union does not provide the company any favours. The union dissects any plan, change, or procedure that is put in place for holes and flaws that can be exploited. Even when a change cannot be exploited, the union can find other “unofficial” ways to work against the company. In general, the union is strong because the industry is very labour intensive; however, PCT is using technology to minimize the labour utilized on site. This can still be seen as a weakness or strength depending on your views and political beliefs. What cannot be disputed are the results PCT has achieved over the years with this strategy. Total costs, before inflation, are half what they were 20 years ago. A side effect of switching to technology from labour is more union – management conflict.

With the focus on technology and automation, PCT has to educate the employees who have to operate and maintain the equipment. This can require advanced and expensive training. In addition to this specialized training, general training is a priority that PCT performs well. PCT attempts to train its entire full-time staff (and as many hall personnel as practical) on a wide knowledge base. Examples of training topics include, fall protection, diversity, accident investigation, leadership skills, etc. This provides the company with well-trained, highly skilled employees. Unfortunately, the amount of money that PCT spends on training has a low rate of return. Most union employees do not see the value in training or they just do not care. It is

difficult for companies to train and control employees who are transient and unfamiliar with each site. The dispatch system for workers puts them into pools and assigns them work as required. This means that training has little effect on employees who may only work for a company a few times a year and thus do not retain any specific skills gained in training. Terminals do not get high value out of their training dollars. For example, the company has spent a lot of time and effort to train employees in topics like hazard recognition, accident avoidance, safety talks, etc. Yet, injuries and accidents still occur at a rate that is well above other heavy industries. To illustrate, in 2004 there were almost 1500 incidents (includes first aid visits, medical aids and lost time accidents) and there are only approximately 3000 longshoremen and 400 foremen employed at the terminals in the Port of Vancouver. That being said, PCT does not have a poor safety record relative to other areas of the waterfront (see figure 9).

However, the majority of PCT's Board of Directors come from the oil and gas industry and are used to one or two lost time accidents every year or two, not every few months, and are understandably shocked at PCT's safety statistics. In the interests of good corporate governance, they feel they cannot sit idly by and do nothing. As a result, safety improvements are high on their agenda. This is a difficult task for PCT to fulfil because there are few incentives for unionized employees to work safe or not exploit the system. The labour model encourages poor safety. For one, many employees are transient and unfamiliar with the site. Second, the union prevents PCT from rewarding good safety statistics because the union views this as "buying safety". The concern is that people who are actually injured will not seek assistance, because they want the rewards or praise that the company may issue for a good safety record. Third, the

**Figure 9 - PCT vs. Waterfront Accidents**



*(Source: British Columbia Marine Employers Association)*

union executives want total control of the union members and if members start working with companies they could lose some of that control. A recent posting found in the union lunchroom ordered union members not to sign any company first aid forms or incident reports. Fourth, the infrequent nature of the work for some individuals causes them to “injure” themselves. For example, if employees know they are not “called back” to work the next day and they believe there might not be a job available elsewhere, injury claims can guarantee pay checks for up to a month.

PCT’s workforce consists of the regular work force (RWF) and casual labour. PCT employs about 20 RWF on a full time basis and casual labour is called in as needed. Including casuals, in total PCT employs the equivalent of 70 full-time positions. The RWF are on schedules that the employees maintain themselves, PCT only requires them to cover any



operational shifts within reason (for instance a graveyard put on at the last minute makes it difficult to get a RWF employee to work).

The 20 foremen employed at PCT are on a schedule that makes up less than half of their total hours worked. Their schedule consists of weekday rotations in all the areas that each foreman is qualified. For example, some foremen have both sulphur and glycol operations qualifications, while others do not. The weeknight shifts, weekend shifts, and non-scheduled weekday positions, which make up the rest of their working hours, are open to all foremen. Earning tabulations occur every week for the foremen and they are ranked from lowest to highest earner. The lowest earner gets the first pick of when he or she wants to work as long as that individual is qualified, not already scheduled, and all the jobs are covered (sometimes foremen have to be forced into a job or shift they do not want because there is no one else qualified to work that job). The dispatch for the foremen is complicated and the official procedure is many pages long covering topics like which jobs have to be filled first or if not all requirements are met then who gets the first opportunity to work overtime. The manager on duty assigns all jobs using the guidelines set out in the dispatch manual, ensuring all required jobs are filled, and everyone is given fair earning opportunities. Everyday the schedule is created for the next day. This method of assigning work creates a few problems. First, the foremen have little ability to schedule their lives, as they are asked daily when and where they want to work, or even if there is opportunity to work at all. Second, it creates situations where games are played within the foremen's ranks, each jockeying for position to work the premium shifts (higher paying or easier). For instance, the collective agreement prevents forced "short shifting", which means foremen can refuse to work more than once in a 24-hour period. Therefore, a foreman who is a high earner can be slotted into a night shift and then refuse to short-shift to days, thus forcing lower earners to stay on the lower paying dayshift jobs. This is a gamble for the foremen because if there is not

enough work at night they may end up sitting at home, however, during busy periods this tactic is well used by some foremen.

Two factors allow the foremen to smooth out their earnings while working an uncertain schedule. First, the foremen have the option of working in the “pool”, which allows them to work at other terminals that require them, as long as they have the necessary skill set required by that terminal. This allows them to work at busy terminals when other terminals are slow. PCT’s management decides if a foreman will be deployed to another terminal, that being said PCT does not normally prevent anyone from working in the pool if all jobs are filled at PCT. Second, all the foremen are guaranteed a certain level of earnings (approximately \$80,000) by the company, if this number is not attained through regular employment PCT will pay the difference.

A problem that PCT is constantly battling is the foremen’s views on fair earnings and schedules. The majority of the foremen do not believe that the current system is fair and equitable. For example, most of the foremen worry that they will not make the guaranteed level of earnings. A great deal of their efforts and resources go into this issue, which seems paranoid when the company has never in its history had to pay. They believe that PCT hires too many foremen to fill the required positions and as a result, their average earnings are falling. To offset what the foremen believe is the company’s wrong doing, some of them use the CBA to prevent the company from fulfilling its objectives. For example, after a foreman has worked 520 hours in any quarter, he or she cannot be forced to work. Therefore, some foremen will work any shift asked of them and more until they reach 520 hours and then they refuse any further shifts. Unfortunately, this puts the company in labour shortage position for the last few weeks of every quarter. To protect itself, the company then hires more foremen to mitigate this risk, which continues the cycle by angering the foremen further.

The payroll is outsourced to ADP Canada, which is inputted daily by the receptionist for union personnel. The data is entered and sent to the industry association who then coordinates the payment through ADP to PCT's employees. ADP directly handles the staff positions, those who are paid on salary. This is an activity that is low skill and relatively unchanging. It is most effective to outsource this function and use resources that would be spent on payroll to better use.

Great West Life handles the outsourced health services. All employees are on a plan, which the company pays into. This provides the employees with benefits and disability insurance without using company resources to provide a service it is not experienced in providing.

The recruitment and hiring process refers to the hiring of staff and supervisors. The real strength that PCT has in this area is that supervisors or foremen (who are unionized by the ILWU through a different local) can be hired from outside the union. Two incentives lure skilled personnel into jobs at PCT. One is the compensation. The average wage for a foreman at PCT is between \$120,000 to \$175,000 a year; well above the average wage outside the industry. Another is the quick entry into the union. After 90 days, the individual becomes a full member of the union. Normally a person must be a casual member of the union for approximately 7 to 10 years before he or she can be voted in as a full member and have all the benefits provided. PCT is the only terminal on the waterfront that can look outside the union for supervisor candidates. This was done through an extensive process of contract interpretation and negotiation between the union and PCT management. This has allowed PCT to draw upon individuals with skill sets and skill levels that other terminals do not have access to. This gives PCT a strong workforce that facilitates better troubleshooting, better leadership, and better management of the workforce, which brings costs down and productivity up, which contributes to PCT's competitive strategy. Hiring from the outside does create tension with the unionized workforce. This tension has subsided in recent years, as more outsiders become union members.

The union's poor internal relations take some pressure off PCT. The different locals (and factions within each local) around the Lower Mainland are at odds with each other for many reasons, most of which are unknown to employers. Years of bad blood have caused internal turmoil in the union. This makes it difficult at times for the union to project a unified front. For instance, a few years ago PCT was in the process of redesigning its dispatch policy for foremen. The foremen were asked to provide inputs and be part of a committee to help in the redesign. However, because of different views on what would be best for each faction a single voice was not present. Depending on who attended the meetings, the requirements and arguments for different systems changed. In the end, the company put in place its own policy. Age and experience on the waterfront segment the different factions of the PCT foremen. On average, the younger foremen value their free time more, are more skilled, and more willing to apply their knowledge than the older foremen. The reasons for this are varied, but the most significant is that the newer foremen have not experienced the cost savings measures of the company over the years.

The culture at PCT differs depending on the level of the company. Among management and non-unionized support staff, the culture is relaxed and warm. Communication is open, interaction among levels and departments is free flowing, and the atmosphere is mostly jovial. Staff members enjoy working at PCT, not only for the work, but also for the people.

The culture between the unionized labour force and management is less positive. The nature of the union - management relationship creates a culture of poor communication and distrust. A history of poor relations with management combined with the current management's focus on reducing costs has created a poor work atmosphere. Workers do not feel valued and are sceptical of management's intentions and vice-versa. Any communication between the two groups is dissected for ulterior motives. As a result, union employees suffer from poor morale and turnover is high. Recently, management has tried to start building trust between the two

groups (starting with monthly communication meetings with Q & A sessions), however this will be a long process and there is a very low probability that relations between the two groups will ever be friendly. A hundred years of poor relations on the waterfront cannot change overnight.

Management experience among staff is well dispersed. Figure 10 shows the years of experience of the managerial staff (excluding administrative staff) at PCT. Almost two thirds of the staff have at least 5 years experience and 28% have over 10 years experience at PCT. In addition, some members of the staff have prior waterfront or related experience.

**Figure 10 - Management Experience at PCT**



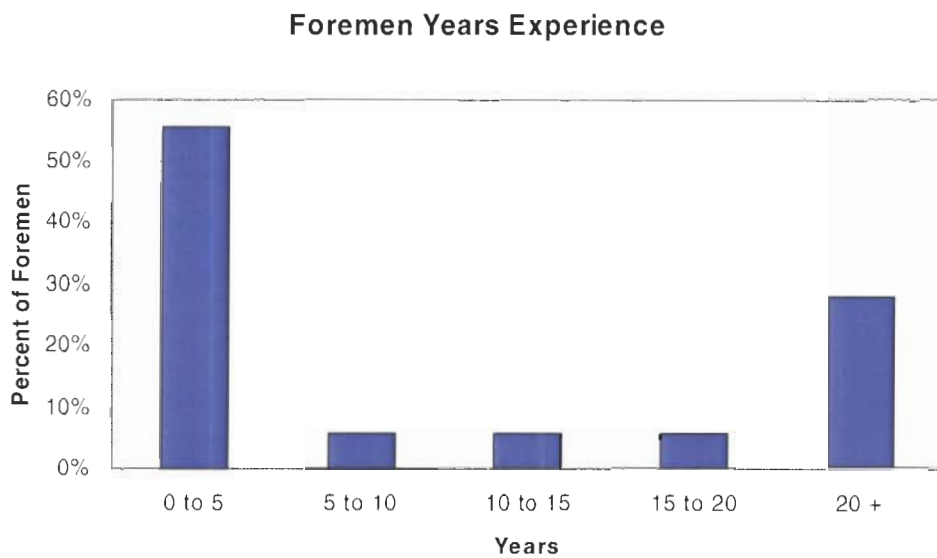
*(Source: Leslie)*

This has given PCT a good base for succession planning, which should start to occur in the next 5 years. Upper management believes in succession planning and endeavours to hire and keep managers that, they believe will eventually move up the company hierarchy.

The foremen's situation is quite different from that of the staff, as figure 11 shows; there is clearly an experience gap. A wealth of experience will soon disappear because the foremen with the most tenure will retire within the next two years. This experience and tacit knowledge

held by these individuals is hard to replace. The majority of foremen (55.57%) have been with the company less than 5 years and 1/3 of them have been with the company less than two years. The turnover rate for foremen is 16.67% a year. In addition, most of the newly hired foremen are new to the industry and the waterfront. This gap exists mostly because of the poor labour relations environment at PCT and better earning potential at other terminals, which cause Foremen to move. The foremen that are the most attractive to other terminals are trained in newer technologies and have some experience. Hence the current demographics, which consists of less experienced and soon to be retired Foremen.

**Figure 11 - Foremen Years Experience at PCT**



*(Source: Leslie)*

An additional concern is the skill levels of employees. It is becoming more difficult to fill positions with qualified personnel. This is not only a waterfront issue; Canada is experiencing a worsening skilled labour shortage. In 2002, over 265,000 jobs in Canada were unfilled due to a lack of skilled labour (Dulipouci 1). At the same time, over 40% of companies in construction and manufacturing are looking to hire full-time employees during the next year (Mallett 3). A Canadian Federation of Independent Businesses survey found that 49.6% of businesses are

concerned about the shortage of skilled labour (Dulipouci, 1). Another recent survey found that 82% of business had trouble hiring skilled labour (Dulipouci, 3). A poll by the Canadian Auto Parts Manufacturers Association found that 13% of the companies polled could not fill skilled trade positions (Solving the Skilled Trades Shortage, 6).

### **3.4.3 Technology Development**

Technology development plays a central role at PCT in creating value in almost all areas. PCT uses three IT systems: STARS, which is a production information system; RSView, which is an operations control system; and a Business Web that facilitates the process of information flow between stakeholders. All of these systems were built or at least heavily modified in-house. In addition, technology is the focus of R & D and automation.

Sultran and PCT conduct most of the technology development through a joint effort. Sultran has a three-member team and PCT has one dedicated employee that work on projects. The decisions on what to develop usually come from the requirements of PCT that is then relayed to Sultran for approval. The IT department is responsive to the needs to the company, but can be overwhelmed by the requests put upon them. As a result, much of the daily administration and grunt work of projects is outsourced to a few small local firms.

STARS performs a number of important tasks for PCT. It provides coordination of almost all information needed to operate, such as vessel tracking, terminal projection planning, labour ordering, terminal performance recording, inventory tracking, etc. This allows managers to look up any information about operations at any time.

RSView is a system that ties directly in to the machines operating the terminal. Through graphs and graphical representations, PCT can monitor real time operations on site or from a remote location. This can help in troubleshooting problems or arranging schedules as production

exceeds or fails to meet initial schedules. This allows quick responses to events as they occur, thereby reducing downtime and costs.

The Business Web is a web interface tool that allows different stakeholders whom do not have direct access to RSView or STARS to obtain information about operations such as cargo releases and vessel schedules. This automatic retrieval of information, bypasses PCT to give stakeholders the information they require without having to directly contact the company. For example, a vessel needs a survey to determine how much product was loaded on it (PCT's scales and flow meters are not considered an official measurement). The company that performs all the surveying of vessels can log onto the web and see when a survey will be required, how much PCT believes is on the vessel, etc.

The above are examples of specific tools in use at PCT; however, PCT also focuses on a few other activities such as R & D and automation. Most R & D involves small projects that most companies would not categorize as R & D. Most automation focuses on existing methods, equipment or procedures. These are medium term activities. Most projects are pushed through to completion once they are started. This can help or hinder the company. Good projects that have faced set backs are not abandoned; unfortunately poor projects are completed as well. PCT is committed to broadening their knowledge base and learning from mistakes.

The majority of the projects are outsourced to (or at least involve) the same small companies that do the administration of IT. Many of these companies have less than five employees. These companies enjoy a very close working relationship with PCT and are depended upon to answer calls for help at anytime. As the terminal continues to increase its investment in technology, the support companies (and their personnel) will become integral to the operations of PCT.



#### **3.4.4 Procurement**

PCT spends a large amount of time sourcing parts. In certain instances quality is the most important factor; in others the cost of parts and equipment is more important. PCT has dedicated staff members that work to meet its procurement needs. PCT has been especially successful finding a core group of contractors that can source or fabricate just about any part. As an example, the sump pumps on the site were deteriorating at a frightening pace. The sulphuric acid in the water was corroding all the pumps' cast iron housings. These are large pumps standing three feet high and two feet wide, which pump water through 10-inch pipelines. The pump design was adequate, but the material was insufficient for the application. The company determined that the patent on the pump design had expired, so with the help of a fabrication shop, it created a casting of the pump. With this casting a stainless steel version of the pump was created, which is impervious to sulphuric acid. This version was more expensive to produce, but had a much lower total cost of ownership because it needed less maintenance and replacement parts. This type of ingenuity helps control costs. This support activity saves considerable amounts of money by finding alternative solutions to problems. OEM parts are usually two to three times more expensive than a part creatively sourced by the purchasing department.

The reduction of costs is an element in PCT's incentive compensation plan. However, the drive to reduce costs is not instilled through the compensation plan. The dynamics of the management group creates the drive to reduce costs. The management team is a tight-knit group that has created a culture and drive from within to cut costs, viewing this activity as a job requirement rather than something to do to get a bonus. The creativity and decisions on what to implement comes mainly from informal talks and discussions in colleague's offices or around the water cooler. While major projects are discussed in the budgeting and planning process, anything smaller and not capitalized is usually done ad hoc.

As more and more pressure is put in place to bring costs down, PCT looks for outside specialists that can perform jobs more efficiently than PCT workers do. PCT employees are trained for regular maintenance of equipment, not design or modifications.

### **3.5 Analysis of Value Chain**

Based on this analysis, it appears that PCT generally knows where its strengths and weaknesses lie and tries to focus its efforts accordingly. Much of the value that PCT creates comes from activities building on one another. For instance, payroll and planning provide operations with feedback to improve production and determine problems, the union relations and legal services are used to obtain gains and concessions from the union, and the recruitment and hiring practices along with proper training supply PCT with high quality supervisors in an industry plagued by transient low skilled employees. These links are important to helping maintain PCT as a competitive company. The support activities enhance the primary activities effectiveness. Unfortunately, it is these support activities that are often overlooked and disassociated with the primary or “core” activities by managers. Ironically, it is the support activities and the links between them that have the ability to help distinguish PCT from other companies in this mature low-tech homogenized industry.

### **3.6 Financial Analysis**

This section provides an analysis of the financial position of PCT. Full financial statements for 2000 to 2004 can be found in appendices 1, 2 and 3, and a summary of calculated ratios can be found in appendix 4. Appendix 5 contains the calculations for Free Cash Flow. The calculations for the Economic Value Added measure are located in appendix 6. Also note that the “loan due to parent” is treated as equity and not debt in all calculations as no interest is due on this loan.

### 3.6.1 Profitability

**Table 6 - Profitability Ratios**

	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
Net operating Margin	40.6%	44.3%	29.9%	31.1%	31.6%
EBITDA	11,872,450	11,473,768	5,527,398	5,717,768	6,441,663
EBITDA/Sales	35.4%	38.6%	22.8%	23.8%	25.4%
EBIT/Sales	24.5%	25.8%	4.7%	2.1%	3.1%
Profit Margin	15.9%	16.3%	2.6%	-0.4%	1.4%
Return on Assets	14.9%	12.3%	2.0%	-0.3%	0.9%
Return on Equity	41.1%	48.6%	9.7%	-1.5%	5.9%

*(Source: Leslie)*

Table 6 shows the net operating margin has been high for the last 5 years, ranging from 29.9% to 44.3%. The EBITDA and EBITDA/Sales ratio have been healthy and have increased dramatically in the last two years. These two trends show PCT operations to be strong (before taking into account effects of financing and amortization factors). The EBIT/Sales ratio has also increased during the last two years. The profit margin has recently been high. However, in the recent past the profit margin was low or negative. This was due to lower than expected volumes for those years in combination with the fixed payments that were required to service the company's debt. The losses in 2001 came after a slight dip in tonnage shipped through the terminal. This shows how important capacity utilization is to PCT and how close the company is to losing money. The return on assets mirrored the trend for profit margins. The large debt financing used to fund operations creates fixed payments that continue even when revenues fall. The return on equity is high because of the small amount of equity in the company's financial structure. Overall, the recent profitability ratios for PCT are excellent.

### 3.6.2 Asset Utilization Ratios

**Table 7 - Asset Utilization Ratios**

	<u>2004</u>	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>
Asset Turnover	0.94	0.76	0.75	0.70	0.66
Accounts Receivable Turnover	4.57	3.71	3.45	4.46	4.99
Accounts Payable Turnover	10.55	5.94	12.61	8.86	8.56
Accs. Rec. Collection Period	79.87	98.36	105.82	81.80	73.21
Accs. Payable Collection Period	4.57	3.71	3.45	4.46	4.99
Cash-Conversion Cycle	84.44	102.07	109.27	86.26	78.19

*(Source: Leslie)*

The asset turnover shows how many dollars in sales are generated from every dollar of assets. As expected, the high capital expenditures required to operate the terminal provide an asset turnover of less than one. This does not mean that PCT inefficiently utilizes its assets. It does show the capital-intensive nature of the equipment and automation used at PCT. The AR turnover has been relatively stable over the past 5 years. It is stable and low because the vast majority of all accounts receivable are from Sultran. PCT's AP turnover was 10.55 in 2004, compared with 5.94 and 12.61 in 2003 and 2002 respectively. The main item to note here is that PCT is doing a good job of keeping AP turnover higher than AR turnover, which indicates good accounting management. PCT is using customer's (although it is mainly Sultran) funds to pay its debts. This amounts to a free loan. The cash conversion cycle has varied over the last few years. The cash conversion cycle in 2004 was 84.44 days, which is a satisfactory amount of time for cash to cycle through PCT's trade accounts.

### 3.6.3 Measures of Liquidity

**Table 8 - Measures of Liquidity**

	<u>2004</u>	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>
Current Ratio	2.03	1.57	1.67	1.67	1.52
Times Interest Earned	20.62	13.59	2.03	0.54	0.58

*(Source: Leslie)*

The current ratio has averaged almost 1.69 over the past five years, indicating that PCT has enough current assets to cover its current liabilities. PCT achieved a current ratio of 2.03 in

2004, which indicates a healthy position. Times interest earned shows that the recent surge in volumes has given PCT the ability to pay interest charges on its debt easily. It has risen from a low of .54 in 2001 to 20.62 in 2004. This again notes the importance that volume has on PCT's economic viability.

### 3.6.4 Financial Leverage Measures

**Table 9 - Financial Leverage Measures**

	<u>2004</u>	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>
Debt-to-Equity	1.30	1.93	3.37	4.22	4.62
Debt-to-Assets	0.47	0.49	0.68	0.72	0.72
Assets-to-Equity	2.76	3.95	4.94	5.84	6.44

(Source: Leslie)

Debt to equity, debt to assets, and assets to equity, have all improved over the past five years. This is mainly because in the last few years actual volumes have surpassed the budgeted volumes that PCT bases its tariff rates on. This has created more retained earnings that have not been distributed to shareholders. Assets have increased because of the implementation of a site restoration fund created in 2003. Overall, the company is highly leveraged, but because of the relatively stable cash flows (discounting the last few years) and the capital-intensive nature of the industry, PCT is not over leveraged. Debt owed to Sultran resembles equity more than debt so it is included in equity and not debt for the above calculations.

### 3.6.5 Invested Capital Measures

**Table 10 - Invested Capital Measures**

	<u>2004</u>	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>
Debt to Invested Capital	0.58	0.68	0.89	0.94	0.96
Trade Capital to Invested Capital	0.32	0.28	0.28	0.24	0.21
ROIC (b.o.p.)	42.6%	41.7%	22.9%	21.9%	22.4%
Invested Capital Turnover	1.20	1.08	1.01	0.92	0.88
Trade Capital to Sales	0.83	0.93	0.99	1.08	1.13

(Source: Leslie)

The debt to invested capital ratio has improved in recent years. The surpluses generated from operations have been used to retire debt and has lowered this ratio from .96 in 2000 to .58 in 2004. The trade capital to invested capital ratio has increased up from .21 in 2000 to .32 in 2004 showing that more capital is being used in short-term business activities. This reflects an increase in accounts receivable and the initiation of a site restoration fund. The return on invested capital is exceptionally strong. ROIC was 42.6% in 2004. The invested capital turnover has risen from .88 in 2000 to 1.20 in 2004. These levels are adequate and indicative of a capital-intensive company. Trade capital to sales again shows the capital-intensive nature of the industry in which PCT operates. For its industry, PCT has healthy invested capital measures.

### 3.6.6 Free Cash Flow

**Table 11 - Free Cash Flow**

	<u>2004</u>	<u>2003</u>	<u>2002</u>	<u>2001</u>
<b>Free Cash Flow</b>	\$4,963,389	\$1,052,835	\$2,159,218	\$2,871,965

*(Source: Leslie)*

Complete free cash flow calculations are located in appendix 5. Since 2001, free cash flow has been positive, indicating that PCT has cash available to pay back to its owners without affecting the growth of the firm.

### 3.6.7 Break-Even

PCT's 2005 variable costs are \$3.49 per tonne and fixed costs are \$7,796,250. The 2005 tariff is \$5.00. This gives a break-even of 5,163,079 tonnes shipped. Volume forecasts for 2005 are 5,555,000 tonnes; therefore, PCT should break-even this year and receive a surplus of \$2,014,473 if the budgeted tonnes materialize (and all indications confirm that they will). The break-even volume is close to the actual tonnage shipped. To illustrate, the amount of volume shipped over the break-even point could be loaded onto vessels in under a week. There is not much room for a decline in shipments before PCT begins suffering losses.

### 3.6.8 Sustainable Growth

**Table 12 - Sustainable Growth Rate**

	<u>2004</u>	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>
Sustainable Growth Rate	59.0%	48.6%	9.7%	-1.5%	5.9%
Actual Sales Growth	12.8%	22.5%	0.9%	-5.3%	-1.2%

*(Source: Leslie)*

The complete sustainable growth rate calculations are available in appendix 4. The actual growth rate has consistently been under the sustainable growth rate during the recent past. This denotes that PCT has sufficient capital available to fund its growth. There is little danger of PCT “growing broke”.

### 3.6.9 Economic Value Added

**Table 13 - Economic Value Added**

	<u>2004</u>	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>
Economic Value Added (EVA)	\$6,830,247	\$6,015,257	\$1,402,441	-\$731,745	\$858,982

*(Source: Leslie)*

The full economic value added calculations can be found in appendix 6. Except for 2001, EVA has been positive in the recent past, indicating that PCT has been earning enough to cover its cost of capital and generate wealth for its owners. The year 2001 presented PCT with a unique set of circumstances. Higher debt, a dip in volumes, and a repayment of deferred taxes caused PCT to destroy value, before the debt repayment and a surge in volumes rectified the situation.

### 3.6.10 Summary of Financial Analysis

PCT provides an adequate profit and return for its owners. The company creates value and satisfactorily performs its duties. PCT is financially solvent and currently benefiting from a surge in tonnage. This assessment must be compared against other potential opportunities for investment. The financial results indicate PCT is a good investment for its owners.

## **4 ISSUES**

PCT is facing a number of issues that are preventing the company from reaching its full potential. This section will discuss each issue in order of importance.

### **4.1 Employee Experience and Turnover**

While staff turnover is acceptable, the foremen's situation is quite different. In the next few years, a wealth of foremen experience is going to disappear due to retirement. The foremen that are retiring are part of the "old guard" and are the most hostile towards current management ideologies. However, the amount of insight and tacit knowledge they possess about operations is valuable to the company. Many of them feel like they are being pushed aside and are reluctant to share their knowledge with the newer foremen.

The experience gap exacerbates the high employee turnover. The turnover is a result of poor morale and better compensation at other terminals. Because PCT is one of the only terminals that can hire foremen from outside the industry it has become the waterfront stepping-stone for individuals who want to get into higher paying jobs. Once foremen are in the industry they can move to any company within the waterfront. Some other positions have annual incentives reaching \$200,000+. These incentives along with the poor morale cause new foremen to leave after they gain enough experience to become attractive to other terminals. PCT ends up with novice foremen or those that are too late in their careers or set in their ways to move to other terminals.



## **4.2 Project Management**

Projects at PCT lack structure. R & D funds are spent on projects with little formal analysis on their payback. Management has a few general ideas of what they would like to accomplish every year and try to align projects to achieve those goals. There is no formal structure for the decisions of which projects will be implemented and which will be dropped.

Once a project begins, it usually has no official champion. A person will have a project on the go, and someone can step in and take over, which can cause the original person to wash his hands of the entire project. Major projects need input from many people and sometimes each person is expected to fulfil a part of the project but is not formally told. This causes the implementation of projects to be piece meal and disjointed. Because there is no champion projects usually cost more, take longer to implement, and are seen through to implementation regardless of their value.

## **4.3 Information Technology**

As PCT becomes more reliant on IT, its management and execution become more important and central to PCT's competitive advantage. PCT uses outsourcing to provide indispensable IT management, execution, and maintenance. In some recent incidences only outside contractors were able to repair a problem. These incidents occur at an uncomfortably high rate. In some cases, only one individual had the knowledge that could alleviate problems that occurred.

Most IT contractors that supply the company with their expertise are small companies that rely on a few large customers. This makes their continued existence unstable. It also puts PCT's operations in jeopardy. It is unrealistic that one person can handle all emergencies that PCT might encounter because it requires too large a knowledge base. Although the current companies provide excellent customer service and response times, PCT takes a risk every time

the sole-proprietor is unavailable (e.g. takes a holiday or is unavailable because of poor cell phone reception during business trips into the interior of British Columbia).

PCT is building a competitive advantage with a corner stone that is not under its full control. Changes in the business cycle, relationship conflicts, or illness could leave PCT non-operational. Outsourcing IT is an effective method of reducing costs; however, as it becomes more central to operational effectiveness this stance may require changing.

#### **4.4 Skilled Labour Pool**

Even when the politics of organized labour are set aside, the general lack of skill presents a problem. Many of the union members have been given their trade credentials, in return for years service. Many electricians are working on high voltage substations because they worked as an electrician 30 years ago in menial electrical jobs. Pulling wire to install a light bulb in a residential house is very different from shutting down a terminal to perform major maintenance on a high voltage substation. Yet, in the eyes of the union (and indeed in the hiring selection process), these tasks are considered the same.

This lack of qualified labour has caused, at times, PCT to cut back on the scope of projects because the required labour order could not be filled.

#### **4.5 Safety and Accident Prevention**

There is a concern to improve safety at PCT, but there is a feeling by management that though they are responsible for safety they have no control over it. A lot of effort is spent on training and education, but there is little correlation between amount of safety training and the number of safety incidents that occur. This a waterfront issue that has been around for many years. Safety is the one area that the union can use for political advantage that PCT has difficulty fighting. Under the CBA, an employee can refuse to work for safety reason without the threat of

discipline. Anytime a member wants to give a terminal difficulty he or she can refuse to work because of safety concerns. Many times the employee is told by the HRDC that no safety concern exists, but this only occurs after a lengthy investigation and the damage to productivity has already been felt.

## **4.6 Capacity and Logistics**

Although, the recent increase in volume is providing many benefits to PCT, the terminal is nearing capacity. PCT has the capacity to move an additional 775,000 tonnes of sulphur per year, but with the Chinese demand continuing to grow, this capacity may be reached in as little as 2-3 years. PCT must ensure that either it creates capacity at its own site or it manages the control of additional capacity at another location.

Bottlenecks occur in trucking, rail, and vessel operations. If world trade continues to increase these areas will see more pressure, bottlenecks, and delays. PCT is a small company with little influence on other steps in the logistics chain. It does not matter if a bottleneck is not under PCT's control and responsibility, if product cannot reach or leave the terminal, PCT is still affected.

## **4.7 Customer Relations**

Tension exists between Sultran and PCT, which stems from two different areas: communication and control issues. There are certain areas, such as rail and vessel scheduling, where PCT's and Sultran's control and responsibility overlap.

In the daily maelstrom that occurs in rail, vessel, and terminal scheduling and operations, sometimes everyone that wants to be informed of every change is not made aware of the latest changes. Sometimes no one cares about being kept up to date and other times it causes tempers to flare. The causes are two-fold. First, too many individuals want to be informed of changes as

they occur. Sultran has a number of changing contacts that all want to be kept up to date on events. Sometimes this is not possible or even practical. The second reason for the poor communications is that the two companies have different corporate cultures. This leads to misunderstandings of roles and responsibilities. Employees for both companies do not realize the pressures and complexities that each are exposed to and handle them differently.

Control is also an issue. In alignment with a low-cost strategy, PCT management does not have the amount of autonomy that it desires. PCT is a cost centre to Sultran. Sultran has ultimate authority over PCT, both as PCT's largest customer and parent company. At times, PCT resists this lack of autonomy, and some resentment exists when Sultran exercises their authority.

#### **4.8 Product Volume Reliance**

An issue that arises out of PCT's strong performance is that (much like the stock market), people tend to forget about the down turns. PCT has no control on the volumes shipped through the terminal. Glycol shipments are contractual with customer volume obligations, but the sulphur division has no such assurances. As recently as 2001, when volumes were 77% of 2004 volumes, management minimized labour and cancelled dozens of shifts that had no operations scheduled.

PCT should be looking at ways to diminish the detrimental effects of the down cycles in volume throughput during the up cycles. As in any strong market, additional sources of supply will materialize (Middle Eastern countries) and product demand will change (China self-sourcing). The steady move to automation increases the fixed costs, as evidenced in the low asset turnover, but reduces the company's ability to cut costs that expose it to losses in a down cycle. PCT must be prepared for a change in volumes.

## **4.9 Public Relations**

A few public relations issues occur because PCT is located in a park like suburb. It does not matter that the port and terminal were located in Port Moody before most residents or that the port is the main reason that greater Vancouver even exists in its present form. The public is quick to notice and complain about real or imagined dust, noise, and light pollution. Some of the causes of the complaints originate from sources out of PCT's control. For example, rail noise and vessel exhaust complaints.

## **5 RECOMMENDATIONS**

Based on the results of the evaluation and the information derived from the analysis, several recommendations follow that deal with the most serious issues. PCT is performing many functions effectively. All of the recommendations relate to improving efficiencies of the terminals logistics, improving communication, and reducing costs.

### **5.1 Supervisor Experience**

Foremen are getting younger and less experienced. This is due to attrition of the older workforce and newer foremen turnover. PCT must increase the foremen's morale. People will always leave for more money and it is difficult to change personal values, but PCT can work to keep the foremen that are leaving because they are unhappy with the current work environment.

The first step is to be brutally honest with the new hires. They must be clearly informed that the overall goal of the company is to reduce costs and a large portion of the company's costs is labour. They must be aware of the situation they are getting into. If new supervisors are informed that foreman labour will be reduced through attrition and that their earnings will stay around the historical averages, it should help to keep foremen working for the company and not constantly worrying about their earnings or job security. The high level of pay will continue to attract a high calibre of foremen.

The company must also strive to improve the culture at the levels below the first line of management. If people are happy to wake up and come to work they are not as quick to leave the company. The best and quickest way to make people happy is to give them responsibility. Although there already is a joint union-company safety committee, it is required under the

Canadian Labour Code and does not provide the required level of input by employees. Safety is too hot of a topic to make inroads on. However, the creation of additional joint committees can tackle some of the problems brought up in this paper like public relations. If the creation of committees tackles problems that face both the union and the company and genuinely allow union members input into the operation and policies of the company a level of trust can be established. This will give employees responsibility and nothing brings together two opposing sides like a common threat.

## **5.2 Project Management**

To start with, managers need education on proper project management techniques. Simple concepts like assignment of a champion, documentation, and project timelines will go a long way in cleaning up many of the problems with project management.

The company should institute a steering committee to analyze projects. The committee would be made up of staff from different levels and departments in the organization. This will provide varying insights and viewpoints on the needs, proceeds, and payback of projects. This committee would also be able to recommend when to kill a project. Most importantly the committee can question whether projects contribute to the overall company strategy.

The analysis of projects needs a stronger financial component. With PCT's simple financial structure, it is easy to determine its cost of capital to use for the Net Present Value, Internal Rate of Return, and discounted payback calculations. These measures will provide the company with better tools in the evaluation of projects.

The most important step to create better project management at PCT is to ensure processes are in place to document project scopes, timelines, and evaluations. These items should be written down before the project begins. The official internal contract of duties and

responsibilities will create a source of information that can be referred to in disputes and to evaluate progress. This will provide a measure of control that is currently lacking; without proper control many changes take place because of a lack of focus or because people cannot even remember what was agreed to in the first place.

### **5.3 Information Technology Outsourcing**

As IT becomes core to the operations of PCT, the company must gain more control over it and minimize risks associated with IT.

One method is to perform more of the important functions of IT in-house. This will give PCT more control and ensure the IT functions will continue to perform at desired levels. The company could hire away employees from or buy out the existing contractors. The wages of the employees or owners can easily be estimated. The security and stable schedules have enough value to give PCT leverage in offering salaries to interested parties. If this fails to provide enough coverage, then PCT will need to find larger, more stable suppliers. Another option would be for the contractors to collaborate with a larger firm that would provide stability and capacity

### **5.4 Employee Skill Levels**

As skill levels of the average employee falls, PCT needs to put programs in place to alleviate the damage from this trend.

Although this has been tried before, the advantages of an apprenticeship program are great enough that it should be looked at again. During the next CBA negotiations the company should push for a better program where employees must commit to a time period (e.g. at least 10 years) of working the trade they apprentice if they stay on the waterfront. This is a reasonable request as the companies would be investing heavily in these individuals and must be assured of some payback.



An apprentice program would be supervised by third party sources. For example, BCIT could be commissioned to supervise the program, where apprentices would work at terminals as well as attend classes to ensure they are educated and tested in the proper techniques.

Convincing the union to partake in any such program will be difficult because the CBA states that only the union has the right to supply qualified individuals to the terminals. However, this same clause can be used to entice the union into agreement. If the unions cannot supply qualified individuals, then the terminals have the right to hire from outside the union. This would dilute the union's power because if current trends continue more and more outsiders would be hired. This appeal to politics may entice them to listen, but the real hurdle will come from the fact that the ILWU is an industrial union as opposed to a trade union. The union executive must represent all the members of the union, where a majority of them are relatively unskilled. The union executives will never put themselves in a position to be seen as abandoning the rank and file membership, as it would be political suicide. The union executive will have to be given the opportunity to "suggest" an apprenticeship program that they could sell to the union as increasing their marketability and relevance in this technologically advanced world. This tactic may provide the program with a chance of working.

## **5.5 Safety Improvements**

Safety improvements can always occur, but the current situation creates statistics that make the entire industry look very poor. PCT must make it difficult for individuals who use safety for political purposes, as a method to take a rest, or as a way of being paid when they would otherwise be sitting at home.

The company should continue to stress safety by making managers more visible to workers. All managers should be entered into a daily schedule of terminal safety tours to send the message that the company is serious about safety.

A foreman that can question everyone involved should investigate every safety incident. If the company feels this is not having enough effect on preventable or exaggerated incidents then a manager should be entered into the investigation process as well. This will send a message that the company is willing to address real safety concerns, which will make it difficult for anyone to use the system for personal gain.

## **5.6 Capacity and Logistics Problems**

There are two methods of dealing with capacity and logistics issues, the terminal capacity can be increased and outside bottlenecks can be removed.

Increasing the terminal capacity requires adding more bulk handling equipment. The addition of a smaller StakRake to the existing site would add 75,000 to 100,000 in storage capacity. If necessary, operations could be performed on graveyard shifts. Currently, PCT utilizes very few graveyard shifts because of the cost and noise issues. This has the ability to increase capacity by at least 25%. A problem will arise because of noise pollution. PCT will have to ensure noise is kept to a minimum. Some changes are already in place that will help keep noise down. For example, the installation of new variable frequency drives in the dumper provided much smoother and quieter unloading operations. A challenge will be ensuring that third parties (like the railway) reduce and control their noise levels on graveyard shifts.

Bottlenecks that occur outside of PCT's control are also a concern. The main bottleneck occurs with the switching of trains from CPR's yard in Coquitlam. PCT could look at employing its own locomotive and switching crew to perform these duties. This would put it under PCT's control. However, CPR's unions would most certainly grieve such an action. PCT is not in the railway business and this would lie outside its area of expertise.

Another method for reducing bottlenecks that PCT should research is to improve its own IT control and information systems to include more information on the logistics flow. Much of the information is already computerized. Sultran, CPR, and CNR have most, if not all, of the information required for PCT to better understand and monitor logistics issues that affect it. The one problem is that other entities may feel threatened because with information comes control (which outside parties do not want to give up).

Because any throughput improvements made at the terminal will still be constrained by CPR's bottlenecks, another option is to relocate or purchase additional facilities at another location. For example, VW could be purchased or a new terminal in Prince Rupert could be commissioned to increase capacity and reduce logistics bottlenecks that would not use CPR services.

## **5.7 Customer Relations**

A few improvements can easily be made to improve customer relations. First, both companies should utilize a formal set of standards and responsibilities to all parties to ensure everyone understands everyone else's role. Second, a single number should be used to get in contact with both PCT and Sultran. That way a message could be left at either number that could allow everyone who needs or wants updated information to receive it. A portable email device could easily provide everyone with updated information. Third, to promote understanding and improve communications each PCT and Sultran managers should shadow each other for a day. This would educate people in the responsibilities, pressures, and objectives of each other. This could build a level of empathy that currently does not exist. Fourth, PCT personnel should be educated on why their autonomy is lower than they would like it to be. If people understand how a lack of autonomy furthers the ultimate low-cost strategy they still might not like it, but it might be better tolerated.

## **5.8 Product Volume Reliance**

PCT management cannot operate on the paranoia that volumes will disappear, but they also cannot expect future volumes to stay at historically high levels. Decisions should be made using lower throughput levels. Data modelling and sensitivity analysis can show how PCT's decisions can be effected by changes in demand and show the negative side effect of decisions that increase fixed costs. Break-even numbers should be calculated to educate managers on the thin margin that exists which is preventing PCT from incurring losses.

## **5.9 Public Relations Improvements**

To improve public relations, PCT must hire a large PR firm with local experience working with large industrial companies. The newsletter is a good tool and should continue to provide insights into the company and educate the public on PCT.

Money spent on public relations activities such as festivals and music performances can be used more effectively in sponsoring other activities. Only a small subset of the community attends art festivals. PCT should sponsor activities like hockey tournaments, a park walkway, etc that have higher population participation. To put a human face to the company and help expose employees to the public, PCT should donate employee time to activities like park maintenance or volunteering at food banks. This would send a message that PCT is a member of Port Moody and that it cares about its fellow citizens. A focus on the environment (e.g. marsh/wetlands development) would project the message that PCT is bringing nature alive.

## **5.10 Implementation**

The analysis shows that PCT has many competencies that allow it to compete effectively. The company however, requires change in a few areas that would allow it to strengthen its ability to align to its low-cost strategy and create value in the process.

The changes that are recommended will be difficult to implement in an environment with the current levels of union – management distrust. This will require a culture shift and complete management commitment to successfully implementing these recommendations. Anything less will result in failure.

In order to effect change, PCT's managers must become leaders. Successful transformation requires leadership as opposed to management. (Kotter 26). Leadership is what establishes the direction the organization is taking, aligns the employees with that direction, and motivates them to succeed. An effective model for transforming an organization through change is Kotter's Eight Stage Process for Change, outlined below. According to Kotter, it is imperative to maintain the sequence of the stages and to skip none of them.

### **5.10.1 Kotter's Eight Stage Process for Change**

#### *5.10.1.1 Establishing a Sense of Urgency*

Complacency can kill the transformation effort. Establishing a sense of urgency in managers and employees is critical to gaining support and motivating individuals to work on the change effort. If PCT openly addresses the issues that are facing the company (and employees) and provides the forum to discuss their impact on everyone involved, it can start to gain support among employees.

#### *5.10.1.2 Forming a Powerful Guiding Coalition*

A strong leader alone cannot sustain the change process; a powerful guiding coalition is required. This coalition must work together as a team. They must also bring a variety of experience, staff positions, authority, and skill sets to enable the team to develop trust among themselves and the rest of the organization. The leader of any change effort at PCT must gauge the competencies of all managers and employees to determine who will become members on the coalition.

### *5.10.1.3 Creating a Vision*

A strong leader needs to create a vision that provides a clear and appealing picture of the future along with a plan on how that vision will be achieved. An appealing vision is one that is desirable, feasible, flexible, and measurable. This vision must be easy to understand for all employees. The creation of such a vision at PCT must encompass the issues identified earlier.

### *5.10.1.4 Communicating the Vision*

The responsibility for the communication of the vision to the organization lies with the coalition. Effective communication requires keeping it simple, continued stress of its importance, using imagery, listening, and addressing any inconsistencies. The danger that PCT faces in this stage is under-communicating the vision, which can stall the entire change process.

### *5.10.1.5 Empowering Others to Act on the Vision*

Barriers can prevent employees from contributing to the change process, even if they wish to participate. The job of the leadership at PCT is to remove systems and structures that undermine the established vision. Barriers can be removed through organizational re-structuring, training, and confronting and removing problem employees.

### *5.10.1.6 Planning and Creating Short-Term Wins*

The importance in this stage is to ensure that both proponents and opponents see evidence that change is taking place and that it is valuable. Creating short-term wins gives the managers the ability to obtain improvement measures, establish goals, and reward people involved in the process. These actions will help win over opponents and help to maintain and build momentum. A short-term win at PCT must occur within 6 months, as opposition to any change would be such that any longer a period would slow momentum.

#### *5.10.1.7 Consolidating Improvements and Producing Still More Change*

Major change efforts take time and resistance can come back quickly. The coalition must continue to strive for further change, enlist others for assistance in the change process, and never rest on past victories. It is fine to celebrate a win, but the coalition should never declare the war won. If upper management declares victory too soon, the past practices can easily reassert themselves and all the effort will have been in vain.

#### *5.10.1.8 Institutionalizing New Approaches*

In order for a transformation effort to be sustained, it must be anchored in PCT's culture so that the new desired behaviours become rooted in the social norms and shared values of the company. This is usually the longest and toughest of the eight stages, but it is also the most important. An important factor in this stage is to take the time to ensure that the next generation of leaders personify the new approach.

## **5.11 Conclusion**

Overall, PCT strategy aligns with the current operating practices of the company. It has provided adequate services to its customers, while keeping costs to a minimum. The terminal has utilized its core competencies in management, technology, and operating efficiencies to obtain a level of costs that the competition cannot achieve. The environment that PCT operates in will likely remain favourable for the near future. The company is benefiting enormously from world demand in commodities fuelled by the Chinese. The focus should continue to be the reduction of costs, while maintaining satisfactory levels of service.

However, as described, the company is lacking in the areas of internal controls (e.g. project management), communications, and logistics. Although the successful implementation of the recommendations will meet its current issues, PCT must continue to evolve to meet new challenges.

Overall, the recommendations made in this paper are incremental improvements to a business model that, while not always functioning as smooth or optimal, is profitable for PCT and Sultran.



# APPENDICES

## Appendix 1 – PCT Balance Sheets

<b>Pacific Coast Terminals Co Ltd</b>					
<b>Balance Sheet (\$'s)</b>					
<b>As at December 31</b>					
	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
<b>ASSETS</b>					
<b>CURRENT ASSETS:</b>					
Cash	513,754	829,912	486,472	888,778	961,977
Site restoration fund	1,603,374	2,422,267			
Accounts receivable	7,339,411	8,010,438	7,034,465	5,387,309	5,089,980
Current portion of long-term note	720,000	720,000	720,000	1,012,500	1,110,000
Prepaid expenses	447,976	737,502	363,016	296,912	180,260
Income taxes recoverable	212,545			473,260	756,604
<b>Total Current Assets</b>	<b>10,837,060</b>	<b>12,720,119</b>	<b>8,603,953</b>	<b>8,058,759</b>	<b>8,098,821</b>
<b>CAPITAL ASSETS:</b>					
Buildings, terminal facilities and equipment.	87,965,507	88,168,751	81,630,906	80,196,679	
Less: accumulated amortization	69,072,448	68,257,792	64,152,772	60,333,205	
	18,893,059	19,910,959	17,478,134	19,863,474	22,666,424
Construction in Progress-New Office Building					
Long-term receivable	3,420,000	4,140,000	4,860,000	5,580,000	
Future Income Taxes	2,604,462	2,535,049	1,433,939	1,048,626	1,325,570
<b>TOTAL ASSETS</b>	<b>35,754,581</b>	<b>39,306,127</b>	<b>32,376,026</b>	<b>34,550,859</b>	<b>38,683,315</b>
<b>LIABILITIES AND SHAREHOLDER'S EQUITY</b>					
<b>CURRENT LIABILITIES:</b>					
Accounts payable and accrued	1,890,185	2,786,719	1,348,458	1,869,706	2,027,767
Due to parent	741,176	310,705	485,583	405,002	178,734
Income taxes payable/(recoverable)	0	2,302,452	592,690		
Long term debt due within one year.	2,720,000	2,720,000	2,720,000	3,012,500	3,110,000
<b>Total Current Liabilities</b>	<b>5,351,361</b>	<b>8,119,875</b>	<b>5,146,731</b>	<b>4,813,948</b>	<b>5,316,501</b>
Long term debt	13,423,239	16,136,850	18,847,126	21,567,730	24,477,205
Long term debt - due to parent	4,250,000	4,250,000	4,250,000	4,250,000	4,250,000
Provision for Future Site Restoration	4,017,733	5,101,383	1,828,673	1,775,369	2,879,126
<b>TOTAL LIABILITIES</b>	<b>27,042,333</b>	<b>33,608,108</b>	<b>30,072,530</b>	<b>32,880,306</b>	<b>36,922,832</b>
<b>SHAREHOLDER'S EQUITY:</b>					
Capital stock:	1,000	1,000	1,000	1,000	1,000
Retained Earnings	8,711,248	5,697,019	2,302,496	1,669,553	1,759,483
<b>Total Shareholder's Equity</b>	<b>8,712,248</b>	<b>5,698,019</b>	<b>2,302,496</b>	<b>1,670,553</b>	<b>1,760,483</b>
<b>Total Liabilities and Shareholder's Equity</b>	<b>35,754,581</b>	<b>39,306,127</b>	<b>32,376,026</b>	<b>34,550,857</b>	<b>38,683,315</b>

## Appendix 2 – PCT Income Statements

<b>Pacific Coast Terminals Co Ltd</b>					
<b>Income Statement (\$'s)</b>					
<b>As at December 31</b>					
	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
Operating Revenue	33,541,351	29,725,591	24,263,515	24,038,091	25,377,946
Operating Expenses	19,936,864	16,543,600	17,002,245	16,565,004	17,355,865
<b>Operating Income</b>	<b><u>13,604,487</u></b>	<b><u>13,181,991</u></b>	<b><u>7,261,270</u></b>	<b><u>7,473,087</u></b>	<b><u>8,022,081</u></b>
Amortization Expense	3,264,580	3,249,540	3,819,565	4,266,253	4,310,746
Administrative Expenses	1,732,037	1,708,223	1,733,872	1,755,319	1,580,418
Net Interest Expense	398,212	563,534	564,460	944,250	1,351,371
<b>Earnings Before Income Taxes</b>	<b><u>8,209,658</u></b>	<b><u>7,660,694</u></b>	<b><u>1,143,373</u></b>	<b><u>507,265</u></b>	<b><u>779,546</u></b>
<b>Provision for Recovery of Income Taxes</b>					
Current	2,948,242	3,206,891	895,743	320,251	825,214
Future	-69,413	-380,312	-385,313	276,944	-400,901
	<u>2,878,829</u>	<u>2,826,579</u>	<u>510,430</u>	<u>597,195</u>	<u>424,313</u>
<b>Net Earnings (loss) for the Year</b>	<b>5,330,829</b>	<b>4,834,115</b>	<b>632,943</b>	<b>-89,930</b>	<b>355,233</b>
Retained Earnings - Beginning of Year	5,697,019	2,302,496	1,669,553	1,759,483	1,404,250
Adjustment of asset retirement obligation		-1,439,592			
Dividend distribution	-2,316,600				
<b>Retained Earnings - End of Year</b>	<b><u>8,711,248</u></b>	<b><u>5,697,019</u></b>	<b><u>2,302,496</u></b>	<b><u>1,669,553</u></b>	<b><u>1,759,483</u></b>

## Appendix 3 – PCT Cash Flow Statements

<b>Pacific Coast Terminals Co Ltd</b>					
<b>Cash Flow Statement (\$'s)</b>					
<b>For the Year ending December 31</b>					
	<u>2004</u>	<u>2003</u>	<u>2002</u>	<u>2001</u>	<u>2000</u>
<b>Cash Flows from operating activities</b>					
Net earnings for the year	5,330,829	4,834,115	632,943	-89,930	355,233
Items not affecting cash					
Amortization	3,264,580	3,249,540	3,819,567	4,266,253	4,310,746
Provision for future site restoration	379,691	353,200	644,448	644,448	644,448
Future income taxes	-69,413	-380,312	-385,313	276,944	-400,901
	8,905,687	8,056,543	4,711,645	5,097,715	4,909,526
Changes in non cash working capital components excluding the current portions of long-term debt and long-term receivable	-2,050,506	1,622,685	-1,087,976	62,431	-2,957,519
	6,885,181	9,679,228	3,623,669	5,035,284	1,952,007
<b>Cash Flows from financing activities</b>					
Repayment of long-term debt	-2,713,611	-2,710,276	-3,013,104	-3,006,975	3,707,376
<b>Cash Flows from investing activities</b>					
Site restoration conducted	-1,463,341	-50,854	-591,144	-1,748,205	-288,273
Investment in plant and equipment	-2,246,680	-4,872,391	-1,434,227	-1,463,303	-1,394,421
Investment in L-T Receivable					-4,782,392
Dividend distribution	-2,316,600				
Collection of long-term receivable	720,000	720,000	1,012,500	1,110,000	277,500
	-5,306,621	-4,203,245	-1,012,871	-2,101,508	-6,187,586
<b>Increase (decrease) in cash</b>	-1,135,051	2,765,707	-402,306	-73,199	-528,203
<b>Cash - Beginning of year</b>	3,252,179	486,472	888,778	961,977	1,490,180
<b>Cash - End of year</b>	2,117,128	3,252,179	486,472	888,778	961,977
<b>Cash consists of</b>					
General purpose	513,754	829,912	486,472	888,778	961,977
Site restoration	1,603,374	2,422,267			
	2,117,128	3,252,179	486,472	888,778	961,977
<b>Interest paid</b>	547,598	752,863	780,937	1,071,874	1,851,346
<b>Income taxes paid</b>	3,207,197	1,497,047		105,454	1,670,848

## Appendix 4 – PCT Financial Ratios

PCT Financial Ratios					
<b>PROFITABILITY RATIOS</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
Net operating Margin	0.41	0.44	0.30	0.31	0.32
EBITDA	\$11,872,450	\$11,473,768	\$5,527,398	\$5,717,768	\$6,441,663
EBITDA/Sales	0.35	0.39	0.23	0.24	0.25
EBIT/Sales	0.24	0.26	0.05	0.02	0.03
Profit Margin	0.16	0.16	0.03	(0.00)	0.01
Return on Assets	0.15	0.12	0.02	(0.00)	0.01
Return on Equity	0.41	0.49	0.10	(0.02)	0.06
<b>ASSET UTILIZATION RATIOS</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
Asset Turnover	0.94	0.76	0.75	0.70	0.66
Accounts Receivable Turnover	4.57	3.71	3.45	4.46	4.99
Accounts Payable Turnover	10.55	5.94	12.61	8.86	8.56
Accs. Rec. Collection Period	79.87	98.36	105.82	81.80	73.21
Accs. Payable Collection Period	4.57	3.71	3.45	4.46	4.99
Cash-Conversion Cycle	84.44	102.07	109.27	86.26	78.19
<b>MEASURES OF LIQUIDITY</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
Current Ratio	2.03	1.57	1.67	1.67	1.52
Times Interest Earned	20.62	13.59	2.03	0.54	0.58
<b>FINANCIAL LEVERAGE</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
Debt-to-Equity	1.30	1.93	3.37	4.22	4.62
Debt-to-Assets	0.47	0.49	0.68	0.72	0.72
Assets-to-Equity	2.76	3.95	4.94	5.84	6.44
<b>INVESTED CAPITAL CALCULATIONS</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
Trade Capital	\$8,946,875	\$7,630,948	\$6,662,805	\$6,189,053	\$6,071,054
Net Plant, Property, and Equipment+other assets	\$18,893,059	\$19,910,959	\$17,478,134	\$19,863,474	\$22,666,424
Invested Capital	\$27,839,934	\$27,541,907	\$24,140,939	\$26,052,527	\$28,737,478
<b>RATIOS BASED ON INVESTED CAPITAL</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
Debt to Invested Capital	0.73	0.84	1.07	1.11	1.11
Trade Capital to Invested Capital	0.32	0.28	0.28	0.24	0.21
ROIC (b.o.p.)	0.43	0.42	0.23	0.22	0.22
Invested Capital Turnover	1.20	1.08	1.01	0.92	0.88
Trade Capital to Sales	0.83	0.93	0.99	1.08	1.13
<b>SUSTAINABLE GROWTH RATE</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>
Retention Ratio	1.43	1.00	1.00	1.00	1.00
Net Profit Margin	0.16	0.16	0.03	(0.00)	0.01
Asset Turnover	0.94	0.76	0.75	0.70	0.66
Assets to Equity	2.76	3.95	4.94	5.84	6.44
Sustainable Growth Rate	0.59	0.49	0.10	(0.02)	0.06
Actual Sales Growth	0.13	0.23	0.01	(0.05)	(0.01)

Note: The above calculations are based upon the financial statements included in the appendix. They are calculated in the usual manner; however, a few changes have been made. The “Loan Due to Parent” is treated as equity because it is interest bearing. This decreases debt and increases equity by the amount of the loan in all calculations.

## Appendix 5 – Free Cash Flow

	<b>Free Cash Flow</b>			
	<b><u>2004</u></b>	<b><u>2003</u></b>	<b><u>2002</u></b>	<b><u>2001</u></b>
Funds from Operations	\$8,525,996	\$7,703,343	\$4,067,195	\$4,453,267
Less: Incremental change in TC	\$1,315,927	\$968,143	\$473,752	\$117,999
Less: Capital Expenditures	\$2,246,680	\$5,682,365	\$1,434,225	\$1,463,303
<b>Free Cash Flow</b>	<b>\$4,963,389</b>	<b>\$1,052,835</b>	<b>\$2,159,218</b>	<b>\$2,871,965</b>

## Appendix 6 – Economic Added Value Calculations

	Economic Value Added				
	2004	2003	2002	2001	2000
<b>Equity</b>					
Retained Earnings	\$8,712,248	\$5,698,019	\$2,302,496	\$1,670,553	\$1,760,483
Long term debt due to parent (no interest)	\$4,991,176	\$4,560,705	\$4,735,583	\$4,655,002	\$4,428,734
	\$13,703,424	\$10,258,724	\$7,038,079	\$6,325,555	\$6,189,217
<b>Debt (Interest Bearing)</b>					
Long term debt due within one year	\$2,720,000	\$2,720,000	\$2,720,000	\$3,012,500	\$3,110,000
Long term debt	\$13,423,239	\$16,136,850	\$18,847,126	\$21,567,730	\$24,477,205
	\$16,143,239	\$18,856,850	\$21,567,126	\$24,580,230	\$27,587,205
<b>Total Capital</b>	<b>\$29,846,663</b>	<b>\$29,115,574</b>	<b>\$28,605,205</b>	<b>\$30,905,785</b>	<b>\$33,776,422</b>
<b>COST OF DEBT</b>					
<b>Tax Rate</b>					
Taxes Paid	\$2,878,829	\$2,826,579	\$510,430	\$597,195	\$424,313
Earnings before income taxes	\$8,209,658	\$7,660,694	\$1,143,373	\$507,265	\$779,546
	35.07%	36.90%	44.64%	117.73%	54.43%
<b>Long term loan</b>					
Interest paid on loan (from note 6)	\$398,212	\$563,534	\$564,460	\$944,250	\$1,351,371
Amount of loan	\$16,143,239	\$18,856,850	\$21,567,126	\$24,580,230	\$27,587,205
Interest rate of long term loan	2.47%	2.99%	2.62%	3.84%	4.90%
<b>Cost of long term debt</b>	1.60%	1.89%	1.45%	-0.68%	2.23%
<b>COST OF EQUITY (use CAPM)</b>					
Rf (10yr TBill Rate)	4.30%	4.30%	4.30%	4.30%	4.30%
Rm (Avg Rate of Market)	12.00%	12.00%	12.00%	12.00%	12.00%
Beta	0.75	0.75	0.75	0.75	0.75
<b>CAPM</b>	10.07%	10.07%	10.07%	10.07%	10.07%
<b>WEIGHTED AVERAGE COST OF CAPITAL</b>	<b>5.49%</b>	<b>4.77%</b>	<b>3.57%</b>	<b>1.52%</b>	<b>3.67%</b>
<b>CAPITAL CHARGE</b>					
Capital	\$29,846,663	\$29,115,574	\$28,605,205	\$30,905,785	\$33,776,422
WACC	5.49%	4.77%	3.57%	1.52%	3.67%
Capital Charge	\$1,639,456	\$1,389,070	\$1,021,487	\$469,836	\$1,239,311
<b>NET OPERATING PROFIT AFTER TAX (NOPAT)</b>					
EBIT	\$8,209,658	\$7,660,694	\$1,143,373	\$507,265	\$779,546
Taxes Paid	\$2,878,829	\$2,826,579	\$510,430	\$597,195	\$424,313
Tax shield on interest	\$139,638	\$207,928	\$251,989	\$1,111,650	\$735,562
<b>NOPAT</b>	<b>\$5,191,191</b>	<b>\$4,626,187</b>	<b>\$380,954</b>	<b>-\$1,201,580</b>	<b>-\$380,329</b>
<b>ECONOMIC VALUE ADDED (EVA)</b>	<b>\$6,830,247</b>	<b>\$6,015,257</b>	<b>\$1,402,441</b>	<b>-\$731,745</b>	<b>\$858,982</b>

Note: From Text Book list of Betas, Compared PCT to Petroleum Industry (.67) and guessed it would be slightly higher (between .67 and .75), so chose .75 conservatively (Value Line Database).

## REFERENCE LIST

- 1) "About Us." May 8, 2005. ILWU Canada Website, February 10, 2005.  
<[www.ilwu.ca/about\\_us.html](http://www.ilwu.ca/about_us.html)>
- 2) British Columbia Marine Employers Association. 2005 Safety Program. November, 2005
- 3) Bryan, Jim, and Rightler, Doug. "Petrochemical Insights: MEG." Chemical Market Reporter 263.12 (2003): 21-22
- 4) Bukszar, Ed. "Course on Business Strategy." Simon Fraser University. Vancouver, BC. Spring 2005. Class Notes and Lectures - MBA607 Business Strategy.
- 5) Channels Newsletter. "What is Ethylene Glycol?" 19.1 (Spring 2003)
- 6) Clarke, Barry. "Sulphur Outlook Presentation." Pentasul Inc. Port Moody, BC. March 2005.
- 7) Conference Board of Canada. Solving the Skilled Trades Shortage. March 2002.
- 8) "Dow Faces Tightening EO/EG Supply in 2005 as MEG Demand in Asia Experiences Rapid Growth. April 5, 2005. Dow website. May 6, 2005.  
<[news.dow.com/dow\\_news/prodpub/2005/20050405b.html](http://news.dow.com/dow_news/prodpub/2005/20050405b.html)>
- 9) Dulipouci, Andreea. (Canadian Federation of Independent Business). Labour Pains. April 2003.
- 10) Energy Information Commission (USA). 2002. Feb 5, 2005  
<[www.eia.doe.gov/neic/quickfacts/quickcoal.htm](http://www.eia.doe.gov/neic/quickfacts/quickcoal.htm)>
- 11) ILWU Canada. May 8, 2004. Feb 10, 2005. <[www.ilwu.ca](http://www.ilwu.ca)>
- 12) Intervista Consulting. "Port of Vancouver Economic Impact Study." April 2005
- 13) Kottler, John. Leading Change. Harvard Business School Press. Boston: 1996
- 14) Leslie, Wade. 2005. Derived from internal sources.
- 15) Levinstein, Joan and Dahong, Zhang. "Inside the New China." Fortune Oct 4, 2004: 84-98
- 16) Mallet, Td. (Canadian Federation of Independent Business). Quarterly Business Barometer. March 2005.

- 17) Mongelluzzo, Bill. "Don't Wait Till Next Year." The Journal of Commerce. November 29, 2004, pg 17-18
- 18) Ober, Joyce A. (U.S. Department of the Interior). Material Flows of Sulphur. Open-File Report 02-298. Reston, VA, 2002.
- 19) Olver, Lynne. "Port Fight Hits Exports from Canada: Disruption Spreads." National Post Oct 8, 2003 National Edition: FP6
- 20) Port of Vancouver. 2004. Feb 10, 2005. <[www.portvancouver.com/trade\\_shipping](http://www.portvancouver.com/trade_shipping)>
- 21) Porter, Michael. Competitive Advantage: Creating and Sustaining Superior Performance. New York: The Free Press, 1985.
- 22) Porter, Michael. "How Competitive Forces Shape Strategy." Harvard Business Review. March-April 1979: Reprint 79208
- 23) US Chamber of Commerce. Trade and Transportation – A Study of North American Port and Intermodal Systems. Washington, DC: GPO, 2003.
- 24) Value Line Database  
[http://pages.stern.nyu.edu/~adamodar/New\\_Home\\_Page/datafile/Betas.html](http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/Betas.html), May 30, 2005.