

# THE MARIPORT GROUP LTD.

## REPRESENTATIVE PROJECTS IN COMPUTER MODELLING

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### **Application of Tug-Barge Systems to Grain Handling in South Australia**

Developed two models that enabled operation and cost of self-unloading tug-barge units to be analyzed. One model analyzed cost and employment of the TBU's in a lighterage mode and also calculated deep sea vessel costs under different scenarios. The second model analyzed transshipment options with the TBU's. Both models incorporated characteristics of seven South Australian ports and developed overall costs and employment across the complete port range.

### **Bahamas Electricity Corporation Fuel Dock**

Developed a financial model for dock operation to demonstrate viability at different throughput levels and charges. A separate model was developed to compare costs and benefits.

### **International Grain Trades Analytical Model**

On behalf of Transport Canada, developed a spread sheet model that enabled the impact of different charter rates and ship sizes on Canadian trades to be analyzed. Provided guidance on update procedures.

### **Voyage Cost Analysis Model**

Worked with a contract programmer to develop a sophisticated voyage analysis model for one of the first business computers. Even with the inherent limitations in memory and storage of computers in 1979/80, the model developed allowed freight rates or costs for multiple ship sizes to be calculated simultaneously, and complex load/ballast options to be quickly analyzed.

### **Salt Mine Shipping Model**

An advanced model of a salt mine from mine face to delivery port, written in APL, was designed to analyze a season's operation, accounting for all variables such as weather, tide, ship arrivals (random and scheduled) and warehousing limits. The model checked very closely against actual experience, helped identify bottlenecks, and by varying parameters, suggested solutions that were implemented by the client.

### **Great Lakes Self-Unloader and Bulker Models**

A spreadsheet-based model was developed in-house by Mariport to analyze supply demand factors in the self-unloader market on the Great Lakes. The model was used over a five years period, and consistently indicated short and medium term pressures on the fleet, when forecast trade was taken into account. A simpler version was developed to permit in-house analysis of the Lakes bulk carrier market.

### **Deep Sea Container Fleet Model**

A model was developed for Transport Canada to permit ready analysis of the incremental cost to deep sea container vessels calling at Canadian ports. The model provided fully built up cost and operating data for a range of box ship sizes on a wide range of Atlantic and Pacific routes.

### **Bangladesh Economic Impact Model**

For a river study in Bangladesh developed a comprehensive cost/benefit model to demonstrate the benefits of flood protection and dredging on navigation and thus regional transportation costs. The model was further developed in Bangladesh for use in the Agricultural sector relative to flood protection.

### **Self-Unloader Chartering Model**

On behalf of a client looking at a specific market for self-unloaders, developed a spread sheet model that permitted a range of self-unloading ships to be theoretically operated in a wide range of trades

against market rates or time charter option. Provided the client with a quick means of analyzing trading options to determine opportunities.

### **Turks and Caicos Financial, Operation and Economic Models**

Prepared a comprehensive financial model of the proposed ports and shipping operation of the Turks and Caicos Islands. A separate analytical model was developed to compare costs and benefits of different port configurations and levels of investment. Other economic modelling has covered alternative dredging scenarios and links between different islands.

As part of the evaluation process for bids on redevelopment of a dock in Turks and Caicos Islands, Mariport developed a model to test proposal viability. The model incorporated traffic forecasts that were integrated with the cost and revenue analysis.

### **Oil Delivery to the Canadian Arctic**

Developed a scheduling and cost model for oil delivery to the Eastern Canadian Arctic that enabled different scenarios to be analyzed and costed.

### **High Speed Ferry Models**

Developed an economic model of ferry operations that enabled different fast ferries to be tested against a particular ferry traffic pattern with, or without, a conventional ferry in the fleet mix.

For another project, developed a comprehensive operational and cost model that enabled parametric analyses to be undertaken of different ferry capacities and speeds. The model calculated an Internal Rate of Return for each scenario to enable the optimum variants to be identified.

### **High Speed Ferry Operation & Financial Model**

Developed a comprehensive operations and financial model, in house, to test various ferry configurations on different routes. The model exists in two variants- passenger only and passenger/vehicle - and also tests various traffic mixes, fare and seasonal assumptions as well as growth characteristics. The model has been adapted and used for most ferry service evaluations since 1999.

### **Cruise Vessel Financial & Operation Model**

For preliminary evaluation of cruise vessel feasibility, developed a suite of linked modules covering capital, operation, crewing, disbursements, fuel, cabin revenue and passenger revenue from onboard sales and shore excursions. The end product is a cost and revenue summary with breakeven load factors.

### **Mackenzie River Risk Analysis**

Created a multi year operations model for the Mackenzie River to assist in the analysis of traffic flows and risk for the proposed gas Pipeline under various draft and season constraints.

## **EXPERTISE IN COMPUTER MODELLING**

Modelling of a transportation system, or systems, can be an important tool in assessing the overall cost or impact of different assumptions relative to impacts or demands on the system.

Computer models, where possible, are developed using Excel because of ready access by clients to the software and an understanding of the system. More complex models are developed by contract programmers working with Mariport; we develop the methodology by which the system should function to ensure that the model reflects real world situations. By carefully checking and documenting the development of the software and then testing it against representative situations where the results have already been calculated by more traditional means, we are able to provide the client with a turn-key piece of software that has already been de-bugged.

Although not usually thought of as computer modelling, we undertake all financial analyses and cash flow projections as well as cost/benefit evaluations using Excel. Such components are often integrated with other, operational modelling. The resultant "model" is then supplied to the client with the report to permit changes in assumptions to be tested.