

## Planning & Scheduling for Bulk Liquid Terminals and Storage Facilities



### Overview

ABB's Planning and Scheduling System for the operation of a bulk liquid loading and storage facility is a business decision support tool for the entire process of handling and management of the bulk liquid components and products. It takes into account:

- Time tabling of activities
- Resource allocation
- Activities including bulk liquid volumes receiving, blending, transfer, ship loading and loading any other means of transportation such as trucks, rail cars and pipelines
- Shipping demurrage

The application also handles optimization of the process of selection of various clients for leasing of the storage facilities based on various parameters such as specific data about the client, the length and profitability of the proposed contract, time and cost requirements for equipment flushing in case of change of product slate, etc.

### Benefits

The totally integrated planning and scheduling system for bulk liquid terminals allows production of just in time final products in the presence of known equipment and storage constraints and permissible transportation infrastructure. The optimizer algorithm solves for an optimal utilization of the individual components making a set of final products of given quantity and quality (specifications). The ability of the Planning and Scheduling System to produce just in time inventories not only saves on storage space, but also allows the flexibility to quickly respond to sudden changes in the shipping schedules due to fluctuating market demands. This also permits the storage space to be more readily available for the next client waiting in a queue.

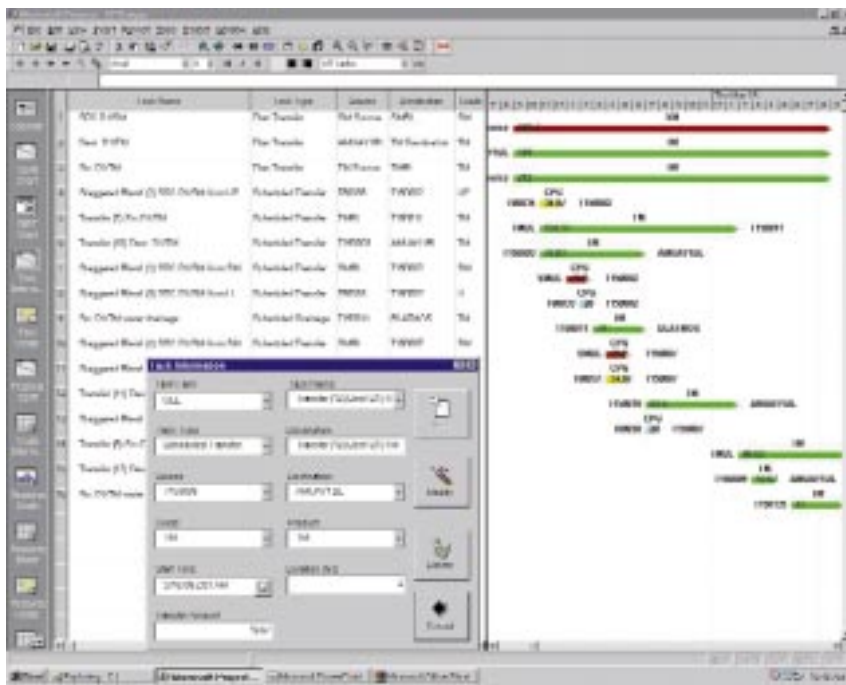
An increase in the bulk loading and marketing terminal revenues of 15 to 25% have resulted attributed to the more profitable and efficient use of the storage facilities. In the terminals that require blending of various components to produce blends of specific qualities, the costs of blends have been reduced 30 to 50% via use of less expensive components and via reduction in the quality giveaways and specification violations.

The system also results in a significant reduction in the amount of time required for the operating staff to enter the work and shipment orders and prepare end of shipment reports since all of these functions are automated by the Planning and Scheduling System.

The terminal planning and scheduling application is designed for a seamless integration with the bulk liquid terminal movements and storage control system described separately.

### Technology Advantage

This bulk liquid handling terminals planning and scheduling system maximizes profits and controls inventory, distribution, production and product-giveaway for any size tank farm. The system ensures compliance with delivery requirements, optimization of production, property pools and significantly increases overall operational efficiencies.



In an environment of flexibility where the terminal management can pick and choose the clients, the system assists the terminal management in selecting the optimal slate of clients out of the entire pool of potential clients.

The schedule generated by the system is always efficient because it allows for occurrence of both sequential and parallel operations within a given scheduling period. The system determines the best alternate solution with consideration of penalty and quality give-away if the present problem is infeasible. The "just in time" operation model saves on product inventory and storage costs.

These complex scheduling problems are handled and solved by the system's high powered optimizer.

### Graphical System

The user communicates with the system through graphic forms and dialog boxes. The system generates interactive Gantt charts and reports. "What if" scenarios and case analyses are easy to implement to aid business decision-making.

### Requirements

#### Minimum Hardware Requirement

Intel Pentium II/333 Mhz  
256 MB RAM

#### Minimum Software Requirement

Windows NT 4.0  
Microsoft Office 97 PRO  
Microsoft Project 98

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OPC/COM or ODBC integration to other systems.

### Local Implementation

ABB is your solution provider. Our Bulk Terminal Planning and Scheduling System represents only one of our totally integrated solution applications. These systems target your particular needs to maximize your profitability.

The Planning and Scheduling System is also designed for production, bulk terminals, refining, petrochemicals, food and beverage, pharmaceuticals, and many other industries.

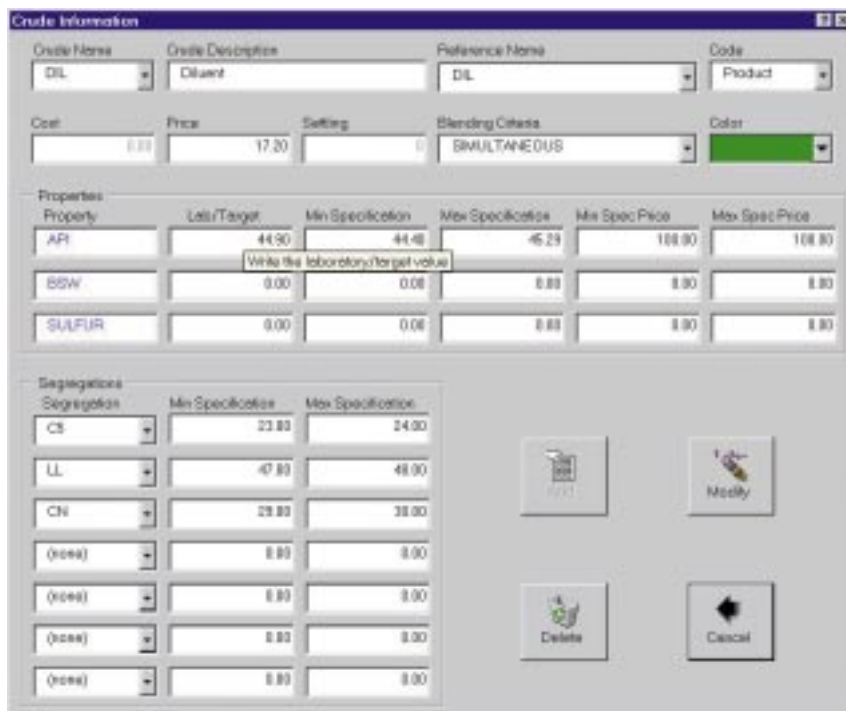


ABB Automation  
Intelligent Solution Products (ISP)  
1515 Broad Street, Building A.  
Bloomfield, NJ 07003  
Telephone: (973) 893-2061  
Fax: (973) 893-8077

**Argentina** Asea Brown Boveri S.A. Buenos Aires **Australia** ABB Industry Pty. Melbourne **Austria** ABB Industrie Gesellschaft Vienna **Bahrain** ABB ARESCON E.C. Manama **Belgium** Asea Brown Boveri S.A. Brussels **Brazil** Asea Brown Boveri Ltda. Sao Paulo **Canada** Asea Brown Boveri Inc. Toronto **China** Asea Brown Boveri China Ltd. Beijing **Denmark** ABB Industri A/S Ballerup **Finland** ABB Industry OY Helsinki **France** ABB IndustrieDecines Charpieu **Germany** ABB Industrietechnik A.G. Mannheim **India** Asea Brown Boveri Ltd. Bangalore **Italy** ABB Industria S.p.A. Milan **Japan** ABB Gadelius Industry K.K. Tokyo **Korea** ABB Woonjin Co., Ltd. Seoul **Malaysia** ABB Industry & Offshore Kuala Lumpur **Mexico** ABB Equipos Y Sistemas Estado de Mexico **The Netherlands** ABB Industrie B.V. Rotterdam **Norway** ABB Industri AS Oslo **Portugal** Asea Brown Boveri Lda. Lisbon **Russia** Asea Brown Boveri Ltd. Moscow **Saudi Arabia** ABB Saudi Arabia Riyadh **Singapore** ABB Process Automation East Asia Pte. Ltd. **South Africa** ABB Industry (Pty) Ltd. Johannesburg **Spain** ABB Industria S.A. Madrid **Sweden** ABB Industrial Systems AB Västerås **Switzerland** ABB Industry Ltd. Baden Dattwil **Thailand** Asea Brown Boveri Ltd. Bangkok **Turkey** ABB Elektrik A.S. Istanbul **United Kingdom** ABB Industrial Systems Ltd. Stevenage **U.S.A.** ABB Industrial Systems Inc. Columbus, Ohio **Venezuela** Asea Brown Boveri S.A. Caracas