



# SHELL

## & REDIFON

# Making sure at Shell

**THE** essence of Shell's international trading business is arranging the supply of crude oil and refined products from various parts of the world to meet the market demands. This involves an intermediate complex of tankers—a fleet of some 280—and refineries, worldwide. Within this complex there are many permutations, combinations and constraints. For example, tankers are of different sizes and used for carrying specific types of oil.

To marry supply and demand, tankers have to be scheduled. Their position, attributes, cargoes, ports of destination, arrival dates, have to be known so that parcels of oil for future delivery can be loaded on to the most appropriate tanker, which for economy of operation, must

be fully loaded. The scheduling is done by experienced staff, who work with daily reports from the data processing system on the status of supply, demand and tankers.

Early in 1974, to handle this volume more efficiently, the company installed a Redifon data entry system. During the course of a day, transactions are entered directly by the scheduling staff via 11 Redifon VDU's installed with the scheduling group. On entry the data is validated and corrected where necessary. At the end of the day the resulting data is communicated to the computer centre at Wythenshawe, where it is processed by an IBM 370/158. The results contained within some 80 reports are available in London the following morning for the start of business.

With Redifon, keying errors have been reduced from some



*Data Preparation Department at Shell [UK] Ltd—London.*

6% to some 2%. This means that much more accurate input information is available. This reduces the impact on the schedule of incorrect data. The entry of incorrect information on, say, tanker availability, could invalidate several subsequent transactions.

The Redifon system also allows Shell to put certain variables on tables that are updated daily by the main computer. Thus invalid transactions are rejected for correction during the data entry phase protecting the accuracy of the main processing phase. To ease identification, all transactions are given a serial number. Thus when the basic activity of the day invalidates a transaction, cancellation is easily effected.

Following the success of this major application, Redifon was installed in mid 1975 by other departments to process inter-

national invoicing tasks, both in transport and involving large sums of money. The first covered aviation fuel and the other marine bunkering. In both of these applications contracts are placed on an international basis using the dollar as the base currency. Records therefore have to be kept of currency fluctuations and pricing agreements with individual operators. This allows for quantity discounts at various levels and leads to retroactive pricing. Credits are made at currency rates going at the time of purchase, which is generally several months previous.

Data for both applications are entered via the Redifon system. On bunkering the volumes are larger. The validation facilities are particularly important when dealing with large invoices, worth hundreds of thousands of dollars, because inaccuracy and



hence delay in settlement impede cash flow and cost the company money. It is important that clean invoices are produced quickly.

Invoices can also be produced more quickly. If it is thought desirable to work overtime to catch an overnight processing for, say, a batch of invoices worth \$50 million, then only one division is involved. Before the installation of Redifon, dockets would have to be prepared, which would subsequently be punched up by an operator—a two-stage operation. Thus the process is now administratively easier.

During 1976 Redifon was applied to four systems for Shell International Chemical Company. The major application is invoicing. For each sale details are entered, with codes for products, countries, customers and internal use.

Some sales are inter-company and involve re-invoicing customers. Each item entered is validated, as is the overall entry. Thus if a contract is f.o.b. then the system checks as a record end edit that insurance has not been included.

The system, which typically handles \$80-90 million worth of invoices a month, has replaced punched cards. Some 200 invoices a day are processed and one wrong card could represent tens of thousands of dollars delayed. The present system incorporates a batch end edit, by which junior clerks check balances. By using such methods there is a much closer control on money movements, involving related locations as far apart as Carrington, near Manchester, and Shell Oil's operations in Houston, Texas. Financial and management data are also more accurate and timely.

Having seen how the system was being successfully used for an aspect of current accounting, other users were quick to see the possibilities in market forecasting. Information concerning the previous quarter is entered, which is used to update a master file, processed by the mainframe at Wythenshawe to produce projections.

Allied to this application is the recording of raw data culled from government sources all over the world on the imports and exports of chemicals, product by product and country by country. This amounts to some 17,000 entries a month. Previously the statistics were copied on to punch documents—another two stage process leading to cumulative errors that could distort reported trends in world trade.

Another major application is in recording the bulk movements of chemicals so that the computer can produce reports similar to those in the international oil business on the status of stocks and ships. A planned application is the use of the data

entry system in settling queries on the suspense account for Shell International Chemical Company.

Shell U.K. have an application in development, handling the materials orders for rigs and pipelines. With the current punched card system delay in entering transactions and also rejections due to invalid data can have a significant impact on oil production. With Redifon validation includes alpha, numeric, and field to field checks as well as a value table check to ensure that the store reference number relates to the stores location.

A number of other systems are at the pilot scheme stage including a stock ordering system that will ensure that a tanker when it sails has its full complement of stores—everything from Elastoplast to winches. The system will produce orders showing supplier, item, quantity, price and codes. A print out will also show quantities used.



*A three-terminal Redifon data entry system alongside the central processors in the Computer Room at Shell [UK] Ltd—London.*

Since 1976 changes have also been taking place on data preparation within the data processing department. The work has been done in three phases.

The first entailed the replacement of card punches by Redifon data entry terminals. An initial project, which involved few formats but a large volume of data entry, showed that two hours key punching a day could be saved by using output programs to preprocess the Redifon input formats into card image form. The programs with input formats were operational within a fortnight. Using this method a repetitive punching to provide a duplicate entry has been eliminated.

On the basis of the pilot project a number of other applications were programmed for the system with complete success. Currently it is scheduled to complete the changeover by the end of March 1979 by when some 20 card punches will have

been replaced by sixteen Redifon keystations.

In phase two all the job control information associated with the applications converted in phase one are also being added to the Redifon system. This information relates to projects processed on both IBM and Univac mainframes. By having the JCL information stored as batches on disk it can be combined with appropriate data to create complete run streams for the mainframe. To enable temporary changes to be made to the JCL information, temporary files are generated for use in a single processing run. With this system runstreams can be assembled by the data control staff using a Redifon VDU, eliminating completely the need to physically handle cards.

Still to be solved within phase two is the problem of dealing automatically with batch control within the data preparation area. Currently the status of the various data batches within the data preparation area is

controlled by a 'paper' system. It is expected in the near future to replace the 'paper' by information that can be displayed on the VDU screen used by the date control staff.

In phase three it is intended to automate everything to do with data handling and job control so that there is no physical manipulation whatsoever. During early 1979, by developing suitable software, it is planned to go from the key-station through a disk transfer to a dual Univac 90/30 Univac configuration which functions as a distributed processing terminal. The 90/30's are in turn connected and work concurrently to a number of Univac and IBM mainframes sited in the UK and Europe. After processing, output reports are returned using the same communications path.

Phase four is to reduce the quantities of paper used. Daily 2,500,000 print lines are produced—but that is the other end of the data entry story.



*Davy Powergas Limited*



*Secondary Oil Recovery Dhahi.*

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