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**FINAL
REPORT**

**PILOT RESTRUCTURING
PROJECT**

**HYDRO-VACUUM
S.A**

formerly

**POMORSKA ODLEWNIA
I EMALIERNIA**

Prepared for

**UNIDO
on behalf of the
UK Know How Fund**

June 1992

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FINAL REPORT PILOT RESTRUCTURING PROJECT HYDRO-VACUUM S A

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EXECUTIVE SUMMARY

1. Hydro-Vacuum (H-V) was established in 1862 and currently manufactures a range of pumps, hydrophones and some castings. Most of its pumps and hydrophones have substantial proportions of the Polish market in their categories. Manufacturing takes place at three locations, Grudziadz, Wabrzezno and Mniszek.
2. Turnover rose from \$12.6 million in 1989 to an unaudited \$15.6 million (ZL.192 million) in 1991. Over the same period after tax profits fell from \$534,000 to a loss of \$1,061,000. Appropriate provisions would increase the loss to \$1.7 million. However, H-V has always made a positive operating profit before interest and tax since 1989.
3. H-V's main financial weaknesses are:
 - lack of liquidity;
 - lack of an appropriate costing system;
 - dependence on manual systems; and
 - overstaffing.
4. Output in volume terms of all the major product lines has fallen substantially over the last three years. Sales in volume terms have probably fallen even more sharply, but price increases have more than offset these falls. The main products are self-priming pumps (36% of sales in 1991) and submersible pumps (26% of sales in 1991).
5. H-V does not have approved international standards for any of its products, which is a major handicap when approaching western markets. Although the pumps are generally recognised as being of good quality, technical collaboration with a western firm would substantially accelerate the technology catching up process.
6. The capital investment requirements to modernise the equipment and to concentrate all production at Mniszek would be \$7.88 million in 1992 prices.
7. New product development is weak. The company lacks an organised market research and marketing department to identify and to exploit new opportunities.

8. Although comparison of H-V's pumps and those of other manufacturers are difficult to make because the specifications vary substantially, H-V's pumps generally appear to be competitive in price.
9. The margins on different products vary widely. This is because of the inadequate product costing system rather than because the markets for some products are more competitive than others.
10. H-V is still a production oriented company and needs to change its philosophy so that it becomes a market oriented company. It needs to establish close links with existing and potential clients, to establish a structured sales force, to strengthen its sales and marketing organisation, and to pursue new export markets in the west, and in the third world.
11. There are substantial sales opportunities in the water industry and the effluent treatment industry in Poland, both for pumps and for turn key projects. Technical collaboration with a suitable western partner would greatly enhance H-V's prospects in these markets.
12. H-V's operating environment is not highly protected, and H-V does not appear to be pricing its products to take advantage of the protection it has. H-V therefore appears to have scope to increase some of its prices in the domestic market and still remain competitive. It suggests too that H-V will be able to compete strongly on price in export markets. Nominal and effective protection analysis reveals that H-V is an internationally competitive company.
13. H-V has about 80% of the domestic market for deepwell pumps, 60-70% for self-priming pumps, 20-30% for vacuum pumps, 10% for centrifugal pumps and 8-10% for chemical pumps. The domestic market is becoming increasingly competitive as western companies increase their marketing efforts.
14. H-V has good management, although the finance and marketing functions need strengthening. There is an excessively large labour force which could realistically be reduced by some 400 from its present level of 1050.
15. The restructuring of H-V should enable useful savings to be made especially in labour costs, and through the concentration of production on one site. On the revenue side the development of new products and export markets should increase revenue significantly over the next few years.

16. H-V needs an injection of finance (debt and equity), management skills, especially in finance and marketing, access to western markets and access to Western technology. The best way to acquire these resources would be through a joint venture with a western company.
17. The new status of H-V will reduce its excessive tax bill. The incidence of the interest bill is high, also. The measures described in this report, plus the tax reductions should enable H-V to return to profitability in the next one or two years. However, given the uncertain economic environment in Poland, forecasts for an individual enterprise are equally uncertain.
18. The internal rate of return on the new investment of US\$6.66 million plus existing assets is 51% when the existing assets are valued at 50% of book value. Even when the assets are valued at 100% of book value, the IRR is 31%. Both these rates of return are very encouraging, and robust enough to absorb some unexpected shortfalls in revenue or increases in cost. The prospects should be encouraging to H-V's management and to any potential joint venture partner.
19. H-V is a sound, well managed company whose problems can be overcome relatively easily by Polish standards. We believe that by following the recommendations in this report that H-V will have a promising future.

CONCLUSIONS AND RECOMMENDATIONS

1. The Interim Report made the following recommendations to ensure H-V's short-term survival, and its continued suitability for privatisation.

- 1.1 Stop production of any components and products of which there is stock in the stores.
- 1.2 For other items, produce only to meet orders and this includes components for finished products.
- 1.3 Be prepared to extend the delivery time against customers orders beyond the present 2 to 4 weeks.
- 1.4 Increase sales promotion activities aimed at selling stock, notably to the Middle East, Latin America and Africa.
- 1.5 Take steps to update and validate all computer product costings.
- 1.6 Stop all manual clerical costing activities, unless replaced by computer. Actual costs are still collected manually.
- 1.7 Reduce staffing in factories and offices as appropriate to the changed circumstances.
- 1.8 Introduce procedures to produce a set of financial accounts each month, including:
 - balance sheet;
 - profit/loss statement;
 - cash flow statement;
 - key ratios.

Further short term recommendations on marketing (not included in the interim report) are as follows:

- 1.9 Screen world markets for finished pumps;
- 1.10 Identify and visit agents, distributors and end users and sell pumps;
- 1.11 Obtain and evaluate relevant Western standards;
- 1.12 Reorganise marketing department;
- 1.13 Reduce product managers to 3;
- 1.14 Redeploy others into external sales positions.

2. PHASE 2: 0-6 MONTHS

2.1 Recruit and train a Cost Accountant (CA). As cost accountants do not exist in Poland, the implementation will need a Polish/German speaking accountant to train a Polish recruit. There may be UK aid funds for training Polish accountants, available through the British Council.

- 2.2 Design and implement (with the assistance of the CA) a new costing system. Train the CA to understand the system and interpret the results for management.
- 2.3 Speed up the programme of implementation of new computer systems, particularly in respect of:
 - CAD/CAM - to reduce design and development labour;
 - Materials control - to reduce clerical labour time in stores, planning and accounting offices;
 - Plant maintenance work - to improve control of work and reduce staffing.
- 2.4 Start a staff reduction programme to reduce total staffing in the factories and offices to 650 eventually.
- 2.5 Introduce budgets of overhead expenses and budgetary control procedures for all production and services departments.
- 2.6 Prepare detailed plans for a possible move of all operations to Mniszek and show the financial result of this.
- 2.7 Review all data contained in the monthly bulletin:
 - replace financial statistics with the new set of financial accounts;
 - correct inaccuracies in overhead expense figures, for example, where direct labour is included in expenses; and
 - show direct and indirect expenses separately.
- 2.8 Clarify the future liquidity prospects of the company.
 - Consider the need for finance for the following capital investment of \$6.66 million.
 - Enter into negotiations with prospective partners and assess the financial prospects.
 - Assess the probability of equity and loans at advantageous interest and repayment rates becoming available from the IFC, the EBRD, the EIB and the World Bank.
 - Prepare a capital expenditure budget for 1993.
- 2.9 Consider employing a full time export manager.
- 2.10 Introduce programmes to modify the company's pumps to conform to Western standards.
- 2.11 Instigate training programmes on all aspects of exporting.
- 2.12 Explore the possibility of distributing H-V's products through potential joint venture partners' distribution networks.
- 2.13 Continue exercise being conducted on the collection of competitors' literature and prices and the technical and commercial comparison of H-V's products.
- 2.14 Ensure Marketing Manager concentrates on strategic issues.
- 2.15 Give priority to improving the marketing department's information base.

- 2.16 Create customer data base and marketing control system.
- 2.17 Introduce sales force reporting system.
- 2.18 Create marketing strategy team.
- 2.19 Marketing strategy team to set new product development objectives and plan.
- 2.20 Create a system which provides control indicators for the Marketing Manager as specified in Chapter 7.
- 2.21 Instigate a programme of formal weekly and monthly meetings.

3. PHASE 3: 3-12 MONTHS

- 3.1 Provide training courses for all senior executives and for all marketing and selling staff in the English and/or German languages.
- 3.2 Prepare a programme of sales promotion of the company's products in Western Europe, the USA and the Far East with specific pump users and competitors identified.
- 3.3 Pursue the potential business in the former Soviet Union to follow-up the obvious demand for H-V products and spares to the point when they are able to pay for supplies. In the meantime find agents to operate on a barter basis in Russia, the Ukraine and perhaps other states, similar to the arrangement in Byelarus.
- 3.4 Introduce all H-V pump products to identified target markets to gain direct export experience.
- 3.5 Enter more competitive markets.
- 3.6 Form a customer service team.
- 3.7 Develop and implement a relationship management programme.
- 3.8 Introduce training programmes on marketing and customer awareness.

4. PHASE 4: 12-18 MONTHS

- 4.1 When the required finance is available, implement the move to Mniszek, and other investment.
- 4.2 Continue to consolidate the new organisation and systems and achieve the associated reductions in costs.

1. INTRODUCTION

1.1 GENERAL BACKGROUND

As a result of recent changes in the Comecon countries towards political democracy and economic liberalisation, the market is changing rapidly and it appears that Hydro-Vacuum (H-V) has been unaware of the major changes in its domestic market. Its lack of marketing information has meant that it is unaware of the structure of the industry, the economic and legislative environment and the opportunities which are presenting themselves. Furthermore, it is unaware of the financing of long term projects which would use its products, notably in water and effluent treatment.

Polish government efforts and expenditure are directed at countering unemployment and inflation in order to stabilise the economy, minimise social hardship and counter the threat of social unrest. Although high on the agenda, environmental protection is still a secondary concern. The introduction of the "polluter pays" principle is designed to minimise pollution and to provide extra income for the water authorities; the measures have so far been only partially effective. However, major environmental spending programmes are now being started. The water industry is one of the first beneficiaries because clean water and effluent treatment are considered essential to maintain the health of the population. Expenditure in water treatment and effluent/ sludge treatment is forecast to reach £438 million by the year 2000.

H-V are excellently placed within the market to benefit from the increased expenditure in these areas but it must realise that as the management responsibility for the water industry is being shifted away from central government to local and regional bodies, it has no alternative but to enhance and capitalise upon the personal contacts made at the local level with the voivodships and the town councils.

1.2 OBJECTIVES OF THE STUDY

As part of the UK Know How Fund programme in Poland, H-V was identified as an enterprise which would benefit from technical assistance for restructuring. The main objectives of the study are as follows:

1. To provide the company with immediate advice to help the enterprise remain in operation by dealing with the short-term technical, marketing and financial problems which it faces.
2. To help the company management to develop a better and more coherent strategic view of its future. This would not only enable the elaboration and implementation of an effective restructuring plan, but also strengthen its position during discussions/negotiations with potential technical and/or commercial partners. The end result of the work would thus be a preliminary proposal for enterprise restructuring.
3. To facilitate transfer of British management consulting know-how to Polish consultants and/or Polish Industrial Development Agency (IDA) staff.

1.3 ENTERPRISE BACKGROUND

Hydro-Vacuum was established in 1862 under the name Herzfeld-Victorious. It currently manufactures pumps, hydrophones and some cast iron products. It has been manufacturing pumps for 75 years, and its products have gained wide acceptance in the domestic market, with the following estimated market shares:

submersible pumps	80%
self-priming pumps	60 - 70%
chemical pumps	8 - 10%
centrifugal pumps	10%
vacuum pumps	20 - 30%
hydrophones	over 50%

It has exported substantially to the former Soviet Union, accounting for 50% of all Polish pump exports to that area. However, this market has recently collapsed.

H-V has three manufacturing locations, at Grudziadz, Wabrzezno and Mniszek.

Turnover (after turnover tax) rose from \$12.6 million in 1989 to \$15.6 million (Z2. 192 million) in 1991. Over the same period after tax profits of \$534,000 declined to a loss (unaudited) of a little over \$1 million.

The company was nationalised without compensation in 1948, three years after adopting the name Pomorska Odlewnia i Emaliernia. It is still owned by the State Treasury, although it was recently converted into a joint stock company. The company recently changed its name to Hydro-Vacuum (thereby reverting to the original H-V initials). We understand that none of the pre-1948 owners or their descendants are still living, and that there is no possibility of a claim of ownership being made on the company. It is now earmarked for privatisation.

The company employs some 1050 people, a substantial reduction on earlier years. The senior management consists of a chief executive officer and three assistants, one responsible for production and marketing, a second for production and technology, and the third for finance and economics.

2. METHODOLOGY

2.1 CONSULTANTS EMPLOYED

The team for the study consisted of staff of Maxwell Stamp PLC, London and NICOM, Warsaw. The team was as follows:

MAXWELL STAMP

Richard Kitchen	Project Director
Michael Gillibrand	Project Manager
Reg Scott-Williams	Manager, Field work
Brian Balcombe	Marketing Consultant
John Parsonage	Accountant
Charles Ponsonby	Economist

We also has assistance from

Dominic Brookes	Pump Manufacturing Expert
------------------------	----------------------------------

NICOM

Grazyna Mazurek	Project Manager
Maria Kudeiska	Market Research
Daria Kulczyska	Interpreter/Assistant
Mr Grejszczak	Legal Expert

(Mrs Kulczyska replaced the foundry expert, Mr Blaszkowski, whose services were not required for the project).

The project was managed by a UNIDO/IDA Steering Committee.

An initial field visit was made in December 1991, with the main field work conducted in January 1991. The team presented an initial report in February 1991, which was followed in March by an interim presentation in Warsaw by the Project Director, who subsequently presented the draft final report in Warsaw in June.

As part of the project, staff of NICOM, the IDA and H-V came to the UK for training from Maxwell Stamp.

2.2 ACTUAL METHODOLOGY

The project focused on the following main topics:

- financial analysis;
- operations analysis;
- marketing audit;
- management audit;
- cost accounting and management information systems;
- legal aspects;
- joint venture possibilities;
- the competitive position of Pomorska;
- performance improvement possibilities; and
- strategy for enterprise restructuring and development.

The structure of this report is based on the above headings. To a significant extent we employed a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, which is also followed to some extent in the report.

2.3 INITIAL THRUST OF THE STUDY

The first priority of the study was to make recommendations to ensure H-V's viability in the short term. These recommendations were contained in the Interim Report, which was much appreciated by H-V's management. They are summarised in Part 1, Initial Analysis, below.

PART I INITIAL ANALYSIS

3. THE INTERIM REPORT

3.1 INTRODUCTION

This section contains the recommendations of the Interim Report. We have not re-presented the financial analysis and product and market analysis contained in the Interim Report, as it is presented in more detail in the subsequent sections, and, to some extent, revised and up-dated.

The objective of the Interim Report was to develop an action programme to enable H-V to survive in the short term until medium and longer term restructuring plans could be drawn up.

3.2 VIABILITY AND PRIVATISATION PROSPECTS

Although H-V has had to face a sharp reduction in its markets it has continued to make a pre-tax profit, to service its borrowings and to pay its taxes; prima facie, therefore, it would appear to be suitable for privatisation. However, it does little forward planning, not even estimating its order book one month ahead, and it suffers from a number of weaknesses that could cause considerable difficulties in the short term and, perhaps, even force it to stop trading. Remembering that marketing aspects had not been covered, the main areas of weakness identified at the interim stage were:

- a lack of liquidity;
- high levels of inventories;
- an inadequate product costing system;
- over-manning, and
- the additional costs of operating at 3 production centres.

The list of problems is formidable but from an initial appraisal it seems probable that measures could be implemented which would significantly improve the situation. Suggestions for improving the marketing aspects, were held over until the Final Report. In the meantime H-V deserves the support necessary to ensure its continued operation, possibly in the form of a reduction in interest payments and/or taxes, for a limited period.

3.3 INTERIM RECOMMENDATIONS

The Government of Poland has already decided to include H-V in a list of a further 28 firms approved for privatisation. As an approved firm it will have the ownership of the land and buildings it occupies transferred to it on becoming a joint stock company instead of a State Enterprise. (That step has now been completed.)

To help ensure its survival so that it remains in operation as a suitable company for privatisation, the following steps should be taken over the next three months:

1. Stop production of any components and products of which there is stock in the stores.
2. For other items, produce only to meet orders, including components for finished products.
3. Be prepared to extend the delivery time against customers orders beyond the present 2 to 4 weeks.
4. Increase sales promotion activities aimed at selling stock.
5. Take steps to update and validate all computer product costings.
6. Computerise all manual cost collection procedures.
7. Reduce staffing in factories and offices as appropriate to the changed circumstances.
8. Introduce procedures to produce a set of financial accounts each month, including:
 - balance sheet;
 - profit/loss statement;
 - cash flow statement;
 - key ratios.

There are, at present, some initiatives under way for possible joint ventures with foreign firms. Such initiatives should be carefully monitored, with no decisions being taken until this appraisal has been completed. A small committee, consisting of the Managing Director of H-V, a legal adviser and the consultants, should be established to deal with the potential partners on a common basis.

3.4 REVIEW OF RECOMMENDATIONS

At this, the Final Report stage, we have no reason to revise any of the above recommendations. We understand that H-V has generally accepted the recommendations and is implementing them.

Some recommendations are longer term in nature, and many need outside assistance. One such recommendation is to computerise all manual collection procedures. Although longer term in nature, the sooner steps are taken to start implementation the better. Hence they have been included in the initial recommendations.

PART II MAIN STUDY

4. FINANCIAL CONDITIONS AND PERFORMANCE

4.1 INTRODUCTION

The main problems facing the enterprise in order of priority are:

1. LACK OF LIQUIDITY

Caused by:

- a) a fall off in orders from their traditional markets;
- b) manufacturing for inventory;
- c) problems with collecting receivables;
- d) the result of the above causing extra cash outflow from taxes being paid on "paper" profits; and
- e) a sharp rise in interest payments.

2. LACK OF AN APPROPRIATE COSTING SYSTEM.

3. DEPENDENCE ON MANUAL SYSTEMS

4. OVERSTAFFING

4.2 PROFITABILITY

The assessment of the financial position of the enterprise is problematic as, the hyper-inflation experienced by Poland in the past few years makes it difficult to make year on year comparisons of the accounts in Zloty terms. Accordingly accounts have been prepared for years 1989 to 1991 in terms of millions of Zloty, and converted to US\$ at the rates shown in the tables in Appendix 1.

The statements analysed are:

- Profit and Loss Statement (in both Zloty and US\$)
- Balance Sheet (US\$)
- Cash Flow (US\$)
- Ratio Analysis (US\$)

All figures quoted for 1991 are unaudited and may be subject to adjustment. The Profit and Loss Account shows that sales have increased from 25.3 million Zloty in 1989 to 180.1 million Zloty in 1991. Pre tax profit showed a rise from ZL 5010 million in 1989 to ZL 16,740 million in 1990 before falling to ZL 6003 million in 1989. At post tax level profit has fallen from ZL 1,068 million in 1989 to a loss of ZL 12,229 million in 1991.

When the figures are converted to dollars the salient points to emerge are:

1. Sales turnover has increased by 7% in 1990 over 1989, and by 15% in 1991 over 1990. This has been achieved despite a drop in production volumes of approximately 48% in 1991 when compared to 1989. This shows that the enterprise has been successful in raising its prices in real terms following de-control in 1988.
2. Profits before interest and taxes have been fairly steady.
3. Interest charges have gone from zero in 1989 to over \$2 million in 1991.
4. This has caused pre-tax profit to fall by 80% in the same period.
5. Against this the tax burden has fallen by just 20% to some \$1.6 million in 1991.

The ratio of gross profit to turnover has stayed consistently over 50% for the last three years, and at 54.86% in 1991 is good. The ratio of pre-tax profit to turnover has declined from 19.81% in 1989 to 3.33% in 1991 indicating the effects of interest charges. Likewise the return on capital employed has declined from 24.16% to 5.37% in the same period.

The picture therefore is one of the enterprise maintaining some consistency at operating profit level, but of interest charges and taxation turning an operating profit of \$2.2 million into a post tax loss of \$1.1 million.

4.3 LIQUIDITY

Although the balance sheet shows net current assets of US\$1.4 million in 1989 declining to US\$0.2 million in 1991, in fact the enterprise had negative liquidity, an excess of liabilities over cash and trade debtors, of US\$1.2 million in 1989 increasing to US\$3.9 million in 1991, a deterioration of US\$2.7 million.

Thus the position is deteriorating. The current ratio shows a decline from 1.24 in 1989 to 1.03 in 1991, but should be at least 2 for safety. The liquid ratio shows a decline from 0.80 to 0.49 in the same period, while anything less than 1.00 signals potential insolvency. Average number of debtor days shows a heartening decline from 115 in 1989 to 65 in 1991, but days taken to turn stock over have increased from 150 to 179 in the same period. This figure is too high, and it should be reduced to 90 days, cutting the value of inventories in half, from \$3,463,000 to \$1,731,500.

If we make conservative assumptions that only 75% of stocks were paid for, and that interest rates in Poland averaged 50% in 1991, then the cost of holding stock during the year was \$1.3 million. Halving this figure would cut \$650,000 from interest costs.

While the debt/equity ratio (gearing) has moved only marginally from 39.4% in 1989 to 33.56% in 1991 this has been achieved at the expense of liquidity. The government has taken out a total US\$5.1 million in taxes for the years 1989-91, against a pre-tax profit of US\$4.7 million for the period, an effective tax rate of over 100%.

The value of treasury capital has declined in real terms from US\$3.6 million in 1989 to US\$3.3 million in 1991 supporting the view that the government has not been investing in the enterprise, but regarding it as a source of cash.

4.3.1 The General Problem of Lack of Liquidity

Poland is incurring a liquidity crisis in general caused by foreign banks refusing to lend to the country combined with tighter monetary controls. This has led to a drying-up of funds, with non-payment being passed from customer to supplier and so on. However H-V cannot claim this as the source of all its woes; in this sense it is more sinning than sinned against as it takes even longer to pay its creditors than has to wait for payment - 157 days as opposed to 65.

It is true to say that the enterprise has been walking a tightrope since the beginning of 1991, and so far has managed to stay afloat largely by prioritising its payments to creditors. At present enough cash is collected to make the obligatory payments of salaries, taxes, bank interest etc - and leaving enough to pay for trade purchases. How much longer this can continue is unclear; the biggest threat is a fall-off in orders leading to a downturn in revenue collections.

4.3.2 Effect of the Fall-off in Orders

The decline in volume has led to the factory manufacturing for stock. This is done partly to keep the factory busy, and to shorten delivery times of its products, which they quote at 2 to 4 weeks. This they feel is necessary to match foreign competition.

In this situation where the product is virtually bespoke, to have a delivery time of 2 to 4 weeks seems unusually short. This again causes stocks to be higher than would otherwise be the case, particularly of part manufactured components. What is required is an integrated system of production planning and inventory management.

4.3.3 The Multiplicity of Products

The pumps manufactured by the factory are based on standard specifications, but the variations attainable by using various combinations of materials and operating requirements turn a notional product line of 300 types into something approaching 6,000.

4.3.4 Analysis of Stocks

An analysis of stocks for the years 1989 to 1991, in US\$ 000s, shows the following:

	1989		1990		1991	
	%	value	%	value	%	value
Raw Materials	61	1,534	46	1,090	34	1,181
Work in Progress	25	625	32	752	34	1,182
Finished goods	11	285	21	502	28	978
Goods for Resale		11	0.5	9	4	121
Consumable Materials etc	3	70	0.5	9	-	-
Total stocks	100	2,525	101	2,363	100	3,463

It can be seen that while raw materials have declined from 61% of total stocks in 1989 to 34% in 1991, work in progress has increased from 25% to 34%, and finished goods has increased from 11% to 28% in the same period. There is clear evidence therefore that manufacturing for stock has been taking place.

The initial reaction was to blame the high level of finished goods stocks on pumps manufactured for a Russian order which have not been delivered as the customer is unable to pay. However, the value of this stock at 31 December 91 was estimated at \$50,000, which is not a significant amount.

The General Manager has stated that a policy of fulfilling orders from stock whenever possible, and not manufacturing for stock, has been instituted, and that he expects stock levels to fall dramatically in the first six months of 1992. Nevertheless we would propose providing for at least 15% of finished goods and work in progress, a total of some \$324,000.

Further analysis of stocks of pumps gives the following breakdown.

Stock being re-worked for the domestic market	\$380,000
Pumps which customers have shown an interest in purchasing before mid March 1992	\$220,000
Pumps which customers have shown an interest in purchasing in first six months of 1992 (additional to the above)	\$46,000
Stocks at major distributors (including switches and bath-tubs)	\$280,000

We found no evidence of stock run-outs.

4.3.5 Analysis of Debtors

At 31 Dec 1991 the aged debtors print-out showed the following:

Age in Days	% of Total	ZL Millions
0 - 30	23	6,490
31 - 60	15	4,154
61 - 90	10	2,827
91 - 120	16	4,401
> 121	36	10,272
Total	100	28,144

The enterprise has an effective computerised sales ledger with aged debtors and automatic issue of reminders, followed up by telephone calls, personal visits and court summonses. They have a full time credit controller who personally visits larger debtors. They have also embarked on a policy of not supplying bad payers. The effect of this is that debtors have reduced steadily since 1989, as have debtor days.

Despite these fine efforts there persists a hard core of debtors, 36% of total, over 4 months old. I would propose to provide for 50% of this amount, i.e. 18% of total debtors. Using the figures for 31 Dec 1991 this would amount to ZL 5,136 million, or \$445,000 at the end 1991 exchange rate.

4.3.6 The Effect of Interest Payments on Liquidity

It can be seen from the accounts that interest swallows up 80% of operating profits. Obviously this cannot continue for much longer and the need for re-financing is urgent.

The enterprise has negotiated revolving credit facilities of ZL 19 billion, (\$1,650,000), although the balance sheet at December shows that only ZL 15.8 billion, (\$1,370,000) has been taken up.

4.4 THE TAX REGIME

4.4.1 Change of Status

On 1 February 1992 H-V became a joint stock company, with the shares 100% owned by the government. This is the first step on the road to privatisation and from henceforth different tax regimes will apply in some cases, notably dividend tax (see below).

4.4.2 Payroll Tax

The system up to 31/12/91 was based on net salary plus company taxes paid on net salary.

The percentages were:

Payroll tax	20.0%
Social insurance	43.0%
State Labour Fund	2.0%
Total State taxes	65.0%
Enterprise Social Fund	1.7%
Total	66.7%

From 1/1/92 the system is:

Gross salary plus taxes on gross salary. The previous net salary is raised by 20%, and an amount equivalent to 20% payroll tax on the old net salary is deducted by the enterprise, (i.e. 16.67%). The other charges are applied to gross pay. The following example illustrates how the system works:

	OLD	NEW
Salary	100	120
Salaries Cost	100	120
Payroll Tax	20	*
Social Insurance & Labour Fund 45%	45	54
Enterprise Social Fund	1.7	2
Total cost of Labour	166.7	176

* paid by employee

Thus it can be seen that the effect of applying the charges for social costs on gross pay rather than on net pay has increased the cost of labour by 5.5%.

4.4.3 The Rules on Writing-off Bad Debts

According to the Ministry of Finance regulation (Dz Ustaw No 10/1911) an enterprise is allowed to open a reserve for bad debts only if bankruptcy proceedings of a debtor have started.

As a potential litigant is required to pay a deposit of 20% of the debt in question into court before proceedings can start it is unsurprising that few liquidation proceedings are started. For practical purposes one can say that provisions on bad debts attracts no tax relief.

4.4.4 The Rules for Writing-off Inventory

Stock must be valued at:

Purchase price for bought-in items

Technical cost of production (materials + direct labour + departmental overhead) for own make, or net sale value if lower than either of the above.

Stock can be written-off commencing the year following the year of purchase or production.

The write-off is limited to a maximum of 50% of value at the start of the year.

The write-off must cease within five years of the date of purchase or production.

4.4.5 Turnover Tax

Turnover tax is payable as a percentage of selling price. It is usually 15% but for pumps it was scrapped in May 1991, and for baths and services it is 20%.

4.4.6 Income (profits) Tax

This is payable monthly in arrears on the profit declared in the financial return, form F-01. The current rate is 40%.

4.4.7 Dividend Tax

Dividend Tax is an obligatory tax for state enterprises. It is levied at 22% of the value of Treasury Capital shown on form F-01, and is payable monthly in arrears. If an enterprise is in trouble it can ask for deferment, or payment by instalments. However, if an enterprise does not pay its dividend tax for three consecutive months, it is a formal justification for an intervention of the Ministry of Industry:

The GM is dismissed;

A "Commisar" is appointed;

the Council of Workers is suspended; and

a rescue program for the enterprise is formulated and introduced.

A state owned company, as opposed to an enterprise, pays a lower rate of approximately 13.75% on Treasury Capital.

4.4.8 Extra Salary (PPWW) Tax

This is a surcharge on salary increases paid which exceed 60% of the rate of inflation. The percentage surcharges vary according to the excess of the salary above the ceiling. Some companies pay 500% surcharge on certain individuals.

Up to and including November 1991 H-V were showing a large pre-tax profit on which they were paying monthly tranches of income tax, but declaring no PPWW tax. The GM hinted that this was being achieved by charging the excess salaries to Work in Progress, and that he would "come clean" in December. This has now been achieved, but hardly makes for meaningful financial management.

4.5 EFFECT OF THE PROVISIONS ON PROFIT

The effect of making appropriate provisions for stocks and doubtful debts would be:

	US\$ 000s
Operating Profit for 1991	2,731
Interest Payable	(2,211)
Pre-Tax Profit for 1991	521
Less provision for slow-moving stock	(324)
Less provision for doubtful debts	(445)
Adjusted pre-tax loss	(248)
Less: Income taxes	(92)
Dividend tax	(715)
Extra Salary Tax	(608)
Post Tax Loss	(1,663)

The effect of making these provisions is to increase the post tax loss from \$1.1 million to \$1.7 million. The amount payable in taxes remains unaffected by the provision for doubtful debts, but stock write downs are allowable provided the criteria described above have been met. Dividend and PPWW taxes are unaffected by profit.

The tax saving of 40% of stock write-down would flow directly into cash, providing a much needed \$166,000.

4.6 COSTS OF SOCIAL BENEFITS

The costs of social benefits are computed and reported in the monthly management bulletin, albeit under several headings rather than collected together. Social costs comprise two elements, those provided under the statutory social fund, such as sick pay, redundancy etc, and discretionary benefits provided by the company.

An analysis of the social fund of the enterprise shows the following:

	ZL millions
Balance 1/1/91	171
Income from government	753
Income from the enterprise	750
Interest	10
Depreciation	194
Incomes from employees	<u>784</u>
	2,662
Cost of providing benefits	1,543
Balance to 1992	1,119

The discretionary company benefits were analysed as:

	ZL millions
Running costs of: lodgings	171
Hostel	155
Dining Rooms	3.9
Health Services	<u>5</u>
	660

Costs of both come to ZL1,779 millions, or 2.6% of total expenses, not a significant amount. Nonetheless, the surplus, combined with the falling pay-roll, may enable the company to reduce its contribution in future years.

5. THE CURRENT COSTING SYSTEM

5.1 THE CURRENT SYSTEM

In general costs are collected on a daily basis by the costings department. Computerisation of the system has taken place, but the information on the print-outs is not reliable, and the only cost detail which is reliable are the historical figures prepared manually and presented quarterly by the costing department.

5.1.1 Materials

5.1.1.1 Receipts

1. On receipt into store a goods-received note is raised.
2. When the invoice is received it is logged in the costs department and passed to purchasing who match it with the purchase order and authorise it. Discrepancies are queried by purchasing.
3. The invoice is then returned to the costing department and is coded by Material Type/Store./department (for indirect materials).
4. It is then batched for input to the computer.
5. A manual summary is made of all receipts for accounts posting.

5.1.1.2 Issues

1. A store issue note is raised by stores and is coded by store/material/product/part no./department (for indirect materials).
2. This is checked and batched by costing department for input to the computer.
3. A manual summary of issues is prepared by costing.

5.1.1.3 Services

1. When a service invoice is received it is logged and passed to the appropriate department head for authorisation.
2. It is then returned to cost department, batched for input to the computer and entered on a manual summary.

5.1.2 Labour

Wage rates, manning levels, bonus (piecework) rates, sickness and holiday benefits are decided at an annual series of negotiations between the various unions, the worker's council and the management.

Payroll for staff has been computerised since 1 Jan 1992. Payroll for non-pieceworkers is due to be computerised during the first quarter of 1992. Computerisation of the piecework element of direct labour is still some way off. The piecework calculations are performed manually and entered as a value into the computer.

5.1.2.1 Direct Labour System

A labour ticket is filled out by the operator for each job, or other code such as idle time. These tickets are verified and coded by the departmental timekeeper, and authorised by the section supervisor. The timekeeper prepares a monthly summary for each worker showing effective and idle time, holidays and sickness. This is transferred to a departmental summary which is used in the management bulletin. The bonus calculations are made by the timekeeper and forwarded to the salaries department.

Details of overtime, sickness etc. on indirect labour are prepared on a monthly summary by the timekeeper who forwards this to the salaries department. The value of adjustments is inputted into the computer and a monthly printout is produced as part of the payroll run.

Totals from this printout are entered onto a manual summary by the costing department.

5.1.2.2 Piecework Bonus System

There are two systems of bonus payment in operation which are listed below.

- a) The technology department sets a target norm for each task. The worker is paid a flat rate bonus for each piece produced over this norm.

b) Task Bonus

For work unsuitable for straight piece work the worker is set a standard time to complete a task. If he finishes the task within this time he is paid a bonus dependent upon the time saved.

The employment statistics at December 1991 show the following:

	No	% of Total	% of Factory Workers	% of Direct Workers
Pieceworkers	178	16.9	41.4	54.6
Other Direct Workers	148	14.0	34.4	45.4
Indirect Workers	104	9.9	24.2	
Total Factory	430	40.8	100.0	
Staff	625	59.2		
Total Employees	1055	100.0		

Thus pieceworkers represent 54.6% of direct workers and 41.4% of factory workers. The costs of piecework payments are not collected at any stage in the costing process. This is also the case with the costs of overtime, sickness, leave and all other components shown as salaries. There is therefore a grave deficiency in the current system.

5.1.3 Overheads

Departmental overheads of all manufacturing departments are collected by departments monthly and a manual summary is made by the costing department. This total is then applied as a ratio to the costs of direct labour (plus payroll taxes and surcharges) incurred in the department for that month. This ratio is then loaded onto the direct labour content of each product group produced in that department for that month, which is then summarised manually by the costing department.

Briefly:

$$\frac{\text{Department Overhead}}{\text{Direct Labour Cost}} = b\%$$

Therefore:

Cost of direct labour booked for product group y for month x $b\%$ = Departmental overhead loading for y.

This overhead loading can vary widely from one month to the next as certain expenses can occur in "lumps", chiefly plant maintenance and renovation.

5.1.3.1 The Problem of Maintenance Costs

When an item of plant is overhauled, costs of the overhaul including maintenance department time and overhead loading booked to the job, are charged direct to that department. At the end of the job it may be decided that this constituted a "major overhaul", giving the item of plant a number of years effective extra life. The costs of the overhaul are then credited to the department and charged to fixed assets, where they are depreciated over the deemed remaining life of the asset.

Thus a department may suffer increased costs over a number of months, followed by a credit for those costs in one month.

The example below show the distortion such items can have on overhead loadings. The Enamelling Plant at Mniszek (Z22) has been used: Figures in millions of Zloties.

Month	Departmental overhead (a)	Including Renovation (b)	Direct Labour Cost (c)	Departmental o/h Loading % (d)
Jan	205,724	31,763	11,129	1,848
Feb	242,832	51,260	15,569	1,560
Mar	316,410	103,482	11,268	2,808
April	237,630	61,678	15,822	1,502
May	151,152	43,297	2,412	6,265
June	234,594	48,177	21,266	1,103
July	218,392	54,038	23,411	933
Aug	247,978	59,929	18,413	1,347
Sep	(107,210)	(198,696)	11,088	-
Oct	259,719	65,308	26,317	987
Nov	265,718	70,148	21,633	1,228

The departmental loading therefore varied between zero and 6,265% in 1991.

5.1.3.2 General (Company) Overheads

The general overheads are collected by the costing department and summarised manually over cost heads in a similar manner to the departmental overheads, but cumulative totals for each cost head are kept.

Costs are collected for the whole company only. Separate cost summaries for each overhead department are not kept.

A general overhead is allocated to production, by product group, on a quarterly basis based on the ratio of company overhead to direct labour plus departmental overheads. The table below shows how cost of sales is arrived at:

	Direct Labour	a	
x	Departmental overhead % =	b	Dept of o/h loading
	Direct Labour + dept overhead =		L
	Direct materials	c	
+	Material handling loading (2.5%)		d
	Carriage In	e	
	Sub Contract Costs	f	
	Special Tools	g	
	Other Costs	<u>h</u>	
=	"Technical" Cost of Production		T
+	Company Overhead	O	
=	Total Cost of Production	P	
+	Direct Selling Costs	<u>i</u>	
=	Cost of Sales	S	

Ratio of O to L = % Loading on Direct Labour and Dept o/hs for General Overhead.

As the company-overhead does not vary to the same degree as the departmental overheads the loading shows greater consistency, although the validity of its basis can be queried.

5.1.4 The Product Costing Printout

The result of all the manual cost collection described above is reinputted into the computer, and used in the product costing printout. This is the supposed definitive document for the costings of each product, but in fact is widely mistrusted. The printout is in fact a strange mixture of standard and actuals, with overheads allocated by the somewhat variable methods described above.

Costs are calculated on

Labour = Standard Time x Standard Rate

Materials = Standard Usage x Actual Price

Departmental Overhead = Ratio of Actual Direct Labour to Actual Departmental Overhead

5.1.5 Relevance of the Costing System

The costing system is largely inappropriate for management decision making in that:

1. The actual amount of overhead can vary wildly from one month to another, as a result of using actual figures which in themselves hold major distortions.
2. The basis of allocating overhead largely in relation to direct labour is inappropriate as with increasing automation, direct labour is forming an ever-diminishing proportion of total costs.
3. The product costing printout is an unsatisfactory combination of standards and actuals.
4. As a result of all the above the product margins reported quarterly in the management information bulletin are dismissed by company management. (See Figure 5.1 "How Costs are Collected".)

5.1.6 Suggested Short Term Actions

1. Marginal cost techniques should be employed for product pricing. This involves calculating the actual direct costs for materials and labour and adding a contribution to cover fixed overheads and profit.
2. Departmental overheads should be loaded at a "standard" rate, which should be recalculated bi-annually.
3. Major overhauls and renovations of equipment should be capitalised from the outset, to minimise distortions to the actuals.

4. The process of making a manual summary at each interface of data collection should cease. A decision must be made to trust the figures collected by the computer, and whatever "manual" summaries are needed should be made on a computer spreadsheet.
5. A more satisfactory method of allocating departmental overheads should be found. This is a complex problem, but a start could be made by splitting overheads between those that vary with direct labour hours, and those that vary with machine hours.

A combination of direct labour hours and machine hour rate should be used in the interim.

6. Company overhead should not be allocated to products. A contribution to cover fixed overheads and profits should be calculated.

	Direct Labour
+	Direct Materials
+	<u>Departmental Overhead</u>
=	Marginal Cost

	Fixed Costs
+	<u>Profit</u>
=	Contribution

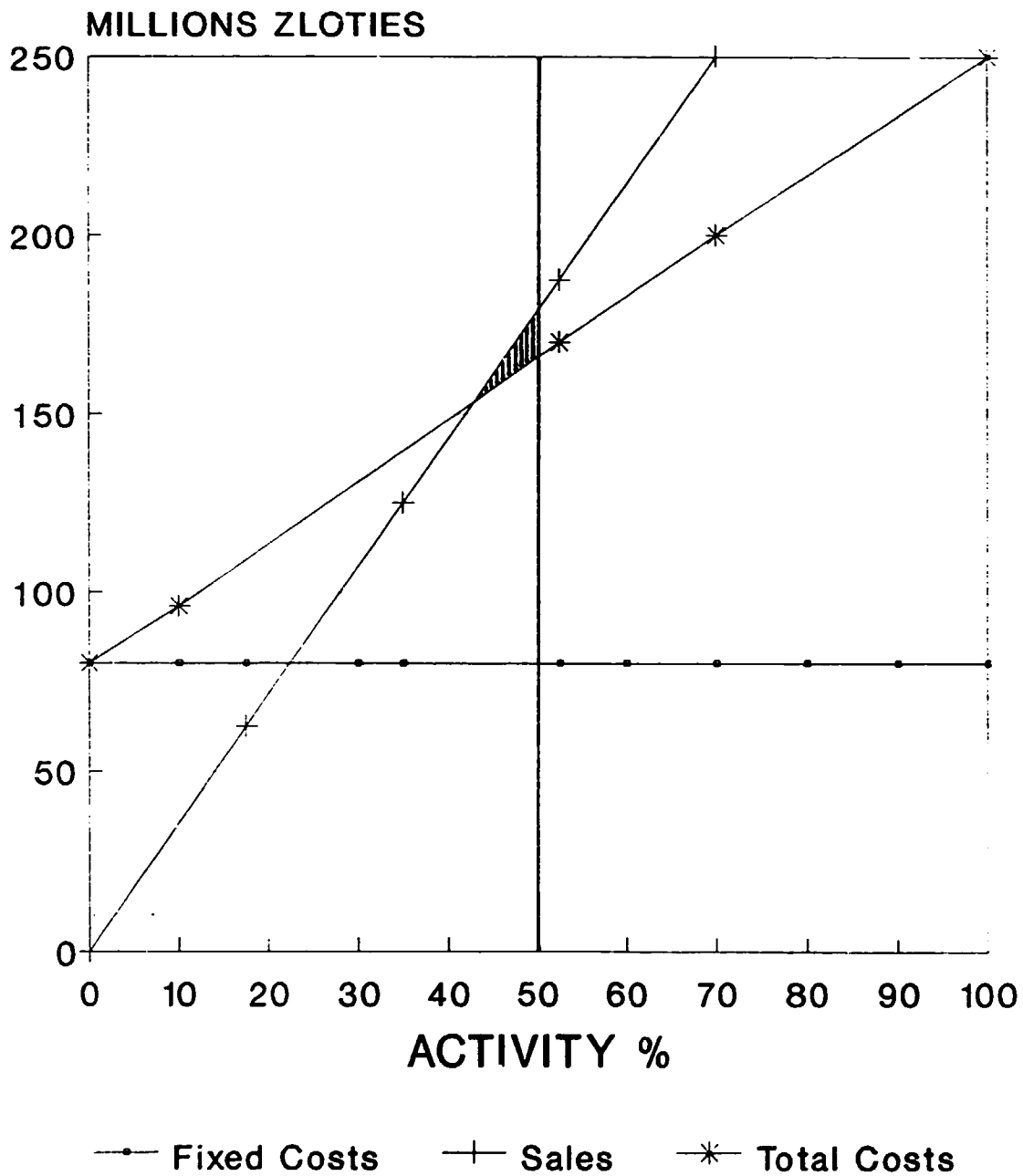
=	Selling Price

To calculate the contribution percentage:

- i) Likely production should be calculated for the next six months and the marginal cost of this should be calculated.
- ii) Probable fixed costs for the same period should be calculated.
- iii) A level of profit should be decided upon.
- iv) The percentage of ii) plus iii) is the contribution loading on i).

The minimum requirement is to break-even, as can be represented graphically below.

BREAKEVEN CHART



The graph is based on H-V's provisional accounts for 1991 assuming they operated at 50% capacity. It is used for guidance purposes only and should not be taken as a definitive forecast. The shaded area represents profit.

- 7) A decision should be made on depreciation of departmental plant and equipment. For the short term this should be treated as a "sunk" cost and shifted to fixed costs. Any new items of plant and equipment should be amortized over its likely future life.

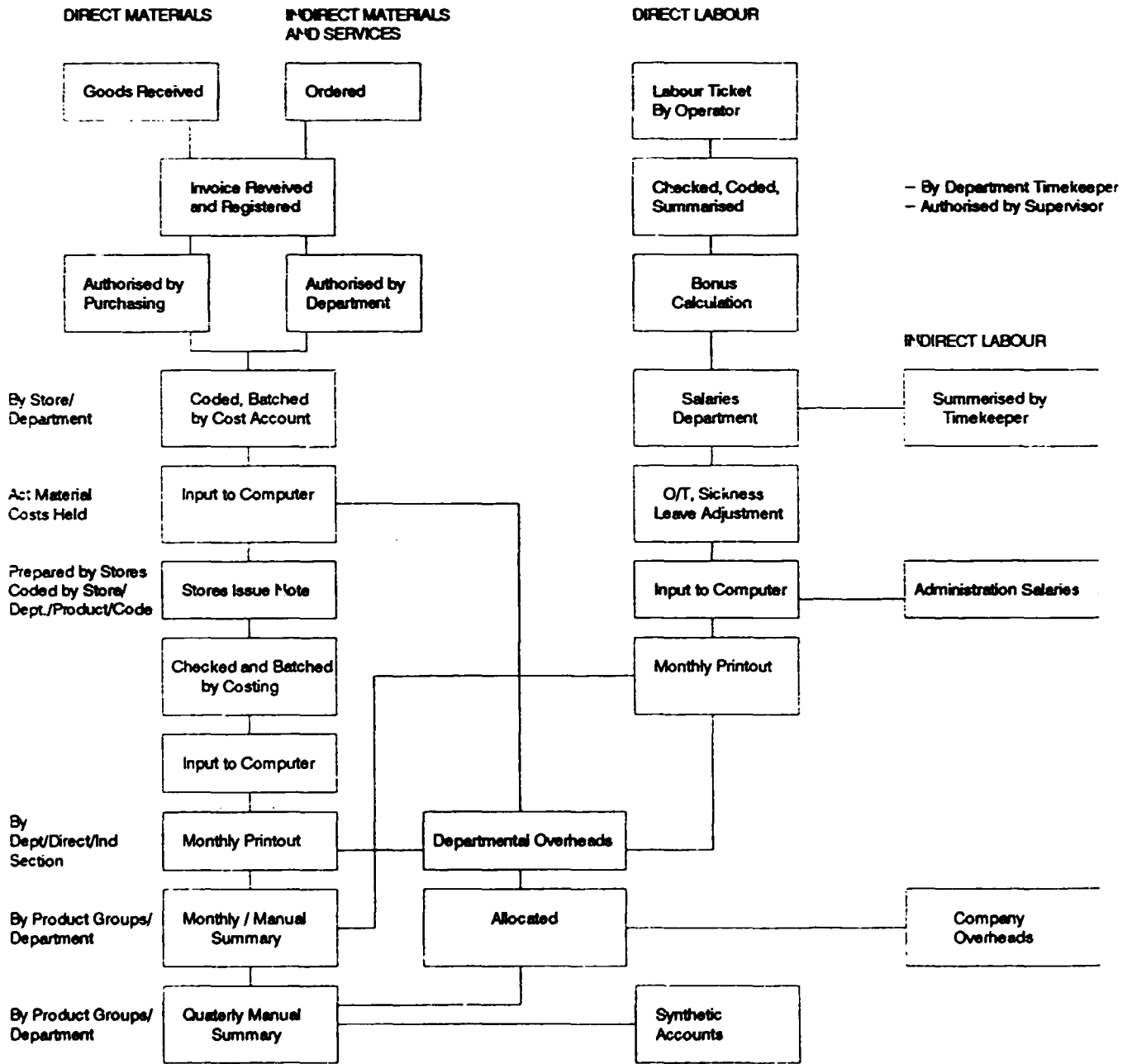
5.1.7 Longer Term Needs

It is clear that H-V requires a new, computer based costing, management accounting and management information system. Such a system would take perhaps 2 man years to develop, install, and modify until it is operating satisfactorily. This is a long term operation and therefore needs to be taken in hand as quickly as possible.

By adopting the methods discussed above, particularly increased computerisation, H-V should be able to cut staff substantially over twelve months.

Figure 5.1

HOW COSTS ARE COLLECTED



6. OPERATIONS ANALYSIS

6.1 CURRENT PRODUCTS

The main products are pumps and blowers of 5 main types (submersible, self-priming, corrosion resistant, circulating and vacuum). Other products are hydrophones, coal stoves, switches and drinking bowls. In addition spare parts and castings under sub-contracting arrangements are produced.

There are over 6.000 variations in the detailed design of pumps and blowers produced to meet customers requirements. In addition to material specifications, the main differences relate to:

- pumping capacity;
- head of liquid;
- nature of liquid to be pumped; and
- environment in which the pump must operate.

There is some standardisation in the use of the same components in different pumps.

Submersible pumps G80 and G100 are to be taken out of production in June 1992.

6.2 PRODUCTION

Table 6.1 shows production of the main items by number for the period 1989-91, together with forecasts for 1992 and 2000. The forecasts are made by H-V, but cover pumps only.

Table 6.1

PRODUCTION - QUANTITY IN EACH PRODUCT GROUP

PROD. GP	DESCRIPTION	ACTUAL			FORECAST	
		1989	1990	1991	1992	2000
1.	Pumps including	63,077	44,744	32,757	36,150	44500
	- Submersible Type G	18,561	13,181	6,814	7,800	15,000
	- Self Priming Type S,SK,SM	40,856	26,282	22,202	24,200	25,000
	- Corrosion Resistant Type KS	777	1,017	923	900	3,000
	- Circulating Type COK,CL	523	2,732	1,818	2,100	3,000
	- Vacuum Type PW,DW	2,360	1,532	1,000	1,150	1,500
2.	Hydrophones	13,500	3,512	2,448	2,800	no
3.	Coal Stoves	43,105	12,354	14,919	15,000	forecast
4.	Switches	192,006	19,692	9,575	30,000	made
5.	Drinking Bowls	24,369	21,090	11,985	14,000	

Source: Hydro-Vacuum

The figures indicate substantial falls in production in all the major product lines. The number of pumps produced almost halved between 1989 and 1991, with major falls occurring in the two main products, submersible and self-priming pumps. The only products whose output increased were the corrosion resistant and circulating pumps, whose volume is small anyway.

6.3 SALES

Table 6.2 shows total sales by product in million Zloty, and by percentage of the total, for 1991. Pumps accounted for 69% of total sales by value, with self priming pumps (36%) and submersible pumps (25%) the dominant products. Of the other products, spare parts sales contributed 8%, which is useful, steady business. Factored goods (mainly cast iron baths made in Germany) added to Z1. 10 million sales. We were not able to obtain sales figures by product for earlier years, nor could we get sales figures by units of each product. Therefore we have to rely on production figures, which give an imperfect picture of sales, as some production has been for stock.

Table 6.2

ANALYSIS OF SALES BY PRODUCT -12 MONTHS TO DEC 1991

	Percentage	Sales ZL millions
Pumps		
Self-Priming Pumps	35.9	60,813
Submersible Pumps	25.1	42,518
Circulating Pumps	1.2	2,033
Vacuum Pumps	2.9	4,913
Corrosion Resistant Pumps	3.9	6,606
Other Products		
Hydrophones	4.1	6,945
Coal Stoves	6.7	11,349
Drinking Bowls	0.5	847
Spare Parts	8.7	14,737
Castings-Sub contract	1.3	2,202
Switches	0.7	1,186
Others	9.0	15,246
Total Other Products	31.0	52,512
Total of Own Production	100.0	169,395
Factored Goods		10,431
Services		5,718
Total Sales		185,544

Source: Hydro-Vacuum

6.4 PRODUCTION PLANNING

The planning department is under the control of the Chief Production Manager with a Planning Manager, with a staff of 18 people, including 8 in the stores at locations Z1 and Z2. Planning and stores people at Wabrzezno (Z3) are under separate control.

Production is planned at the end of each month for the following month for all operations on component parts and for the assembly of finished products. This is done with a detailed knowledge of materials/components in work in progress in all departments, and from a physical count of all stocks at each month end. A continuous record is maintained on computer of all raw materials and finished components purchased from outside the company and held in the stores. It is updated with receipts and issues and shows the quantity and value of each item.

The production plan is initiated by the Marketing Department and planners show requirements for materials/components over the month and the stocks available. Plans are developed to show quantities to be produced. These are usually in excess of quantities required for sales orders and hence surplus

components are made for stock. Production planning and control is carried out efficiently, but the company does not use the normal practice in the capital goods industry of manufacturing to order. It should change its practice, and manufacture to order. At present the company aims to complete a customer's order for pumps in 2 to 4 weeks from receipt of order. In some cases, all components are available and the work only involves assembly, testing and painting; in others, delivery may even be made from stock. The practice of delivering from pre-manufactured components and from stock should likewise be abandoned.

6.5 PRODUCTION PLANT

6.5.1 Foundry

One of the two auto-casting lines is over 20 years old and is in need of overhaul. A new line will become necessary within 5 years and will cost at 1991 prices about US\$0.5 M.

The coke furnaces were relined during 1991 and should have a further life of 5 years. There is a tentative plan to convert the foundry to electric arc furnaces so as to be able to melt both iron and stainless steel. Such furnaces would cost about US\$ 220,000 each (capacity 500kg) and the cost of 4 has been included in the move to Mniszek.

6.5.2 Machines

At present 12 workstations are numerically controlled. With batch sizes currently run, it would be advantageous to increase this number. Such tools would cost up to US\$ 250,000 each.

In general, most of the machines in current use are said to have a life of 10 years left in them.

6.5.3 Standards

Manufacturing operations are carried out to the worldwide standard ISO 9000 and the similar EC Standard EN 2900. However, H-V has not obtained approval for these standards. Neither do its products have any standards; indeed H-V has had difficulty in obtaining copies of relevant standards. It is important that it does acquire standards for its products; until it does, many foreign markets will remain inaccessible. However, self-priming pumps are manufactured for shipboard applications and are approved by shipping agencies such as Lloyds, even though they do not carry approved western standards.

6.5.4 Environmental Audit

It is beyond the scope of this study to conduct an environmental audit. However, an impressionistic view is that the business does produce pollution, but not excessively so. The dirtiest part of the company is the foundry at Mniszek. The management is aware of the EC's regulatory directives.

6.6 PRODUCTION ENGINEERING

The Production Engineering department consists of 23 people and is divided into 3 sections.

- a) The sections produce specifications on computer of all operations of work to be performed in a factory to make each manufactured component in each different product. These show: machine set-up times; machining time per piece by labour skill grade; wage cost for each operation; and the total cost for the production cycle.
- b) Similar specifications are produced for all sub-assembly and for final assembly testing and painting operations on each different product.
- c) In addition most of the tools required for production machines, for example press tools for the Press Department are designed by this section. Tools are then made in the Tool and Die Shop.

The Department also carries out time and method studies of production work and prepares instructions on work methods for Factory Supervisors.

Generally speaking, the quality of the products is good.

6.7 PRODUCT DEVELOPMENT

The Design (Konstrukcyjny) and Development Department employs 19 engineers, including 2 working under contracts, in drawing offices and in a development and test laboratory. The main projects in progress at present are:

- motors for submersible pumps;
- corrosion resistant pumps for the chemical industry; and
- motors for circulating pumps.

6.7.1 Submersible Pumps

About 40% of total production is of this type of pump. A special technology is used to enable the electric motors to operate under water. At present all small motors are imported from Germany and are Franklin design (USA) whilst others are made in Poland. The company aims to produce its own motors for submersible pumps over 8" in diameter in the future, and prototypes are now under construction and being prepared for testing in the laboratory.

It has been estimated that new machines required for the production of submersible pumps would cost US\$1.8M (at 1991 prices), which is probably about \$2 million now.

6.7.2 Corrosion Resistant Pumps

There is a possibility of manufacturing single stage pumps of this type in 44 sizes under licence from a large Italian pump manufacturer, Ebara. This will require electric arc furnaces for producing stainless steel castings which would cost US\$220,000 each (1991 price). See 6.5.1.

6.7.3 Motors for Circulating Pumps

These are at present of Polish design using roller bearings and are too noisy for domestic applications. Pomorska proposes to design and manufacture a new range of electric motors using sleeve bearings for quiet running.

6.7.4 The Need for Technical Collaboration

As Poland has been outside the mainstream of western pump development it would take many years to catch up through organic development. Indeed, it may not be possible to catch up. Therefore we believe it is necessary to enter into a technology transfer agreement with a foreign partner to reduce the catching up time.

6.8 MAINTENANCE

This is a large department of 174 people, based mainly at Mniszek where the workshops and laboratories

are located. Work is organised into mechanical and electrical maintenance sections. In addition there is a small section responsible for safety.

The Electrical Maintenance Manager is responsible for power, heating, compressed air, and water treatment services at Mniszek which employs 20 people.

There are problems in the costing of maintenance work done, discussed in 5.1.3.1. Production departments have no information of the cost of maintenance work done for them and of the effect of this on the loading of overhead expenses on their departments. There appears to be no system whereby production managers are required to approve maintenance work done. Moreover, the maintenance department is overstaffed, which leads to excessive maintenance work.

6.9 COMPUTER FACILITIES

6.9.1 Software in Current Use

On ICL ME 29

- i) Item and Product Codes
 - Specification List
 - Production Timings of components

 - Material usage of components
 - Assembly Timings
 - Throughput of: Foundry
Enamelling Plant

- ii) Cost Sheets of: Products
Sub-Assemblies
Components

- iii) Value of: Work in Progress
Raw Materials
Components
Scrap
Quality Control Rejection

- iv) Volumes of: **Actual Production**
 Throughput of machine groups
 Throughput of departments

- v) **Materials Management**
 Material Codes
 Materials Movements
 Inventory of Materials

- vi) **Assets Register**
 On PC386: Accounts receivable
 Accounts payable

6.9.2 Software under Development not yet implemented

Materials Management System - on ICL ME29

Payroll System - on PCs

Costs of Production - Components and Products on ICL ME29

6.9.3 Plans for 1992

The overall intention is to develop existing systems inhouse, whilst buying in packaged software for well defined uses (e.g. CAD, Sales Order Processing). The software packages currently in use consist of:

	Cost (ZL Million)
i) Logocad CAD System - Software	80
(Bought In for Design Dept) Hardware	70
ii) Finished Goods Management and Sales Order Processing	
Bought In - On 4 networked PCs	
Novell Network	30
Software	40
Hardware	30
iii) Developing Accounts Payable Receivable	
Developed inhouse on existing hardware	
Estimated Cost	15

- iv) Staff Management
Software inhouse, purchase one PC On ICL ME29 25
- v) Materials Management Foundry
Specialised system for materials used in the manufacture
of moulds and covers. Inhouse on ICL ME 29

In addition there is a plan to introduce dBase III + system for software running on PCs. This would entail networking all PCs on two Novell networks, (one for accounts and one for marketing).

6.9.4 Plans for 1993

- i) Transfer software running on ICL ME29 to PCs.
- ii) Extend CAD system to technology department.
- iii) Computerise Quality Control department.
- iv) Document management system for General Managers secretary.

Estimated costs of the above: ZL 120 millions.

6.9.5 Comments on Computerisation Plans

Broadly speaking the department is adopting the correct strategy in developing systems on PCs and aiming to link those via a network. It is disputed that two networks should be installed as financial data is useful to the marketing department and vice-versa.

The phasing out of the ICL ME29 should generate significant savings in terms of electricity, maintenance and staff, leaving the computer department as a systems design and development department with one manager and three or so designers/programmers.

Priority should be given to those systems which would give the most immediate results, namely:

- i) The introduction of CAD to improve product quality.
- ii) The introduction of networked systems, particularly Sales Order Processing and Costing. Considerable staff savings in both the above areas could be effected by the elimination of manual recording, batching and typing of data.

iii) However, no mention is made in the plans for the introduction of spreadsheets. Particular use could be made of these in the production of management reporting, currently contained in the monthly bulletin, to improve accuracy, speed and presentation.

6.10 THE COST OF MOVING PRODUCTION TO MNISZEK

The costs of establishing all operations at Mniszek (Z2) by moving machinery and stores materials and all administrative services from Grudziadz and Wabrzezno were originally estimated as follows:

	US\$
1. 4 new electric arc furnaces for the foundry	880,000
2. Dismantling and erecting 137 machines in new locations	200,000
3. Transformation of old foundry into assembly plant with test stations and paint shop	600,000
4. Equipping and reorganising the stores	80,000
5. Transport costs	120,000
6. Establishing power, heating and air services	220,000
7. Preparing documents/plans for the move	60,000
8. New office building	220,000
9. Other items (adaptation of offices, laboratories tool shop and computer centre)	<u>400,000</u>
TOTAL	<u>2,780,000</u>

H-V has now produced a revised estimate of \$2.0 million in total, but without a detailed breakdown.

It appears that the planning of a move of this magnitude and complexity has not yet been carried out in the detail necessary to ensure minimum disruption of production and sales over the period of the move. The move cannot be undertaken until the necessary funds are available, but management estimates that it would contribute substantially to reducing employment by 400 people. There would also be significant savings in transport costs, as materials would not need to be moved between locations.

6.11 CONCLUSIONS

There is considerable scope to improve operations through further investment. The table below summarises the possible investments which may be made over the next few years, using both the original estimates and H-V's latest revisions, supplied to us on 15 June 1992.

Table 6.3

CAPITAL INVESTMENT REQUIREMENTS

The capital investment costs identified in this section are

	US \$ million Revised Estimate	US \$ million Original Estimate
1. Foundry: New Line	0.06	0.5
2. Machine Shop: 10 new work stations	2.50	2.5
3. Machines to produce submersible pumps	2.00	2.0
4. Computerisation	<u>0.10</u>	<u>0.1</u>
SUB-TOTAL	4.66	5.1
5. Cost of Relocation to Mniszek	<u>2.00</u>	<u>2.78</u>
TOTAL COSTS	6.66	7.88

For purposes of discounted cash flow estimates in chapter 15 we will use both estimates to test the sensitivity of the restructuring plan to capital investment costs.

Finance for capital investment may be obtainable from a joint venture partner, or from international agencies such as the European Bank for Reconstruction and Development, the International Finance Corporation (which has an office in Warsaw), from the World Bank loans which are disbursed through the commercial banks, or from export credits.

7. MARKETING AUDIT

7.1 ORDER ANALYSIS

The data needed to make a detailed analysis of orders by product, customer and market segment are not available, so an attempt has been made to use what figures are to hand to form some meaningful conclusions. Hence the number of invoices and turnover (net of sales taxes) for the years 1989, 1990 and 1991 have been used.

Table 7.1

ANALYSIS BY VALUE AND INVOICE

Year	No. of Invoices	Sales US\$ '000	US\$/Invoice
1989	5075	12637	2490.05
1990	6818	13553	1987.80
1991	8126	15620	1922.22
Change % 1989/91	+ 60.1	+ 23.6	- 22.8

Clearly the 60.1% increase in the number of invoices produced per year over the period 1989-1991 is an indication that this function needs computerising as has already been suggested. The greater number of invoices being produced and the 22.8% reduction in invoice value confirms that a larger number of customers are being supplied at a lower unit value. Indeed, elsewhere in this report it will be seen that the number of customers has increased from 100 to 3000 over this period. The establishment of a multi-layered distribution network is therefore necessary to reduce the number of lower value invoices and the over stretching of internal resources.

7.2 PRODUCT ANALYSIS

7.2.1 Existing Products

Although there are 6000 variations of pumps and blowers produced to meet customer requirements, sales of all except the KS corrosion resistant pumps and the CL circulating pumps have all showed substantial declines. Demand has decreased particularly for the submersible pumps due to the cancellation of a Russian export order and a reduction in the level of expenditure on the rehabilitation and construction of water extraction systems in the domestic market.

The marginal increase of 18.8% from 773 in 1989 to 923 of production of the corrosion resistant pumps is due to industry demand. The increase in the production of circulating pumps from 523 in 1989 to 1818 in 1991 should be viewed against a peak of 2732 in 1990. These pumps are destined for the domestic construction market and as this market is in decline it is doubtful whether sales can be maintained.

7.2.2 New Product Development

By relying on a range of products designed only to pump clean water, little has been done to develop new products for a changing market place except improving the existing ones. Poland's approaches to join the EC via the European Economic Area, coupled with its current privatisation policy has increased the profile of its environmental pollution problems. The necessity to improve its water and sewage treatment plants to meet EC directives can only be achieved by substantial investment and the expertise of Western companies. This is particularly the case with effluent treatment which is the major problem, where French companies such as CGE, Lyonnaise des Eaux and SAUR have already negotiated management agreements with local authorities. H-V do not have a capability in effluent treatment and this needs rectifying in the short term. Any joint venture with a foreign enterprise must include this feature.

The company has suffered from a lack of innovation in recent times. This has manifested itself in a general inflexibility and reluctance to change as well as in a very poor new product development record. H-V will have to be prepared, with a foreign partner, to invest heavily in new product development. Moreover, it will have to show a much greater willingness to be led by customers' changing needs and priorities. The company needs to be market driven, not production driven as in the past.

To improve new product development performance someone should be given overall responsibility for new product development, and produce a formal plan with performance objectives specified so that progress can be formally monitored. People in all departments should formally recognise the importance of effective links between the customer and the technical design departments.

7.3 PRICING & MARGINS

7.3.1 Export Pricing

An analysis of the prices of competing goods is supplied in Appendix 2. These list the pump type number, motor power and voltage, and prices for the motor plus pump, and in some cases individual prices for the pump and motor. Prices are FOB Polish border prices but due to the differential arbitrary discount structure being operated for export markets these prices can be considered as CIF prices to Western Europe, North Africa and Middle East markets.

7.3.2 Domestic Market Pricing

H-V operates a differential discount policy for its domestic clients. For orders up to Z1 100 million, no discounts are given. For orders over this amount, 5% discount is given.

Distributors who buy for their own stock and resale are granted the following terms:

- maximum date of payment 30 days;
- if payment made within 7 days, a discount of 10% is received;
- for cash or cheque payment a 15% discount is received; and
- payment terms apply to all products excluding baths and kitchen stoves.

Stockists are companies which have H-V stock on consignment and pay for the goods once they are resold. They are supposed to order and sell a minimum of Z1 200 m per month. They sell from the domestic price list and receive between 5 and 10% as discount off the domestic price list.

Generally both distributors and stockists are able to mark up the domestic price list by 10%, for resale to customers and receive a 10% discount of the domestic price list. This approximates to a mark up of 20% on the ex H-V price. Ways of increasing this margin to motivate distributors need investigating.

7.3.3 Overall Pricing Policy

As far as market information will allow, H-V operate a market led pricing policy. The suspect cost accounting system does not allow accurate manufacturing costs, overhead recovery or amortisation to be calculated. Thus a market led fixed gross margin policy is operated.

7.3.4 Margins

The financial accounts for 1991 show overall gross margin/turnover at 54.9%. Despite the suspect cost accounting system mentioned above, gross margins for 1991 by product have been calculated and these are shown in Appendix 3. Percentages vary between - 56.3% for the self priming pump S and a very suspect + 375.1% for the circulating pump CoK (calculated from a negative manufacturing cost). A summary is provided below.

a) Self priming pumps S, SM and SK2 to SK8 + 12.04%

NB: This figure is low because of the 56.3% loss on the S pumps

b) Assemblies of hydrophones and self priming pumps - 19.4%

c) Circulating pumps (CL and CoK) + 193.6%

NB: This figure is distorted by the negative manufacturing cost for the COK pump

d) Corrosion resistant pumps (KS) + 33.9%

- | | |
|---------------------------------------------------------|----------|
| e) Vacuum pumps and blowers (PW and DW) | + 101.7% |
| f) Submersible pumps (Types G60-G125;
GA, G3 GC, GD) | + 28.5% |

7.3.5 Margins - Marketing Conclusions

The conclusions to be drawn from the above are that there is a need to:

- Concentrate on the sales of high margin vacuum pumps, blowers and corrosion resistant pumps.
- Reappraise the manufacturing costs of the self priming S pumps to bring it into line with the remainder of the group averaging + 29.1%.
- Reappraise the manufacturing costs of the hydrophone assemblies, to make the gross margins positive. If this is not possible there is a need to reduce sales and marketing activity on these products, and perhaps to drop them altogether;
- Reappraise the manufacturing cost of the circulating pumps. If the gross margins are indeed as high as + 193.6% then undertake an aggressive sales and marketing campaign for these products;
- Reduce the sales and marketing effort for the submersible pumps on the domestic market as demand is switching from clean water to dirty water pumps and pursue a far more aggressive overseas marketing campaign.

7.4 PROMOTION

7.4.1 Current Promotional Activity

Literature is very much product orientated, there being no general sales leaflet of the type that western companies prefer for general distribution. The same theme predominates in the exhibitions where products are displayed with little applicational information provided.

Advertising in the trade press and newspapers concentrates on promoting the company name and is targeted by product application or industry. Little use is made of press releases reaching industry decision makers, even though magazines do exist for H-V's industry segments of chemical, food, water, environment, fuel and gas, processing. In addition entries are maintained in certain trade directories such as KOMPASS.

No marketing control system is in operation nor is there any merchandising except for a few diaries and calendars.

The proposed promotional budget for 1992 is ZL 230 million, of which 44% will be spent on trade fairs in Poland, 23% on a 30 second national television slot, 15% on 5 press insertions, and 15% on other advertising. This is a significant reduction on the 1991 programme. This is not of much concern, as direct contacts with customers is the most important form of promotion for H-V.

7.4.2 Changes Required

7.4.2.1 New Literature

As the foundation stone for the rest of the marketing action plan, the company must produce a colour brochure to cover the company's products and to promote its own image. Although the existing literature is well produced it is still very much product orientated. The essence of good literature is good photography and the pictures rather than the words should tell the story. H-V must, therefore, invest in good photographs of the company's facilities and particularly onsite pictures depicting its current activities. These should all be taken by an experienced commercial photographer.

H-V should produce a six page A4 format brochure with plenty of space for photographs with small captions. One page should be devoted to company details which will obviously be of interest to the large, users and local authorities. This exercise should be conducted as early as possible to assist the newly appointed salesmen and distributors to promote H-V.

7.4.2.2 Lead Follow Up

As there is no structured sales force, any leads which are produced are not followed up on a formal basis. There is therefore a waste of opportunities and a large amount of resources in generating them in the first place. As more enquiries and leads are produced the salesmen will have even less time to follow them up, but responses should be qualified by telephone from the head office before being sent to the appropriate sales representative. Qualified leads will emanate from a variety of sources such as exhibitions, television and press advertisements and they should all be channelled through the same person at head office.

7.4.2.3 Relationship Management

H-V has a reputation for good quality products in the pump industry throughout Poland, but that industry and the people in it are changing faster than ever before. Furthermore, competition is increasing and it is therefore important and urgent that H-V places emphasis on relationship management. Apart from the current Sales and Distribution Manager and the yet to be appointed salesmen there are few H-V staff who have direct contact with the customers. The increase from 100 to 3000 customers means that all staff from senior management to the shop floor should be aware of the need to obtain and keep customers.

All directors and senior managers should make courtesy visits to customers according to a planned schedule. No company will ever be market led if its decision makers do not have sufficient direct contact with the market. The aims of these visits are to show customers that H-V is interested in them and committed to them, to review H-V's performance as a supplier (and rectify any problems which may come to light) and to gather intelligence about the market place. The objective of the programme should be to visit all local authorities and key contractors at least once a year.

The company should be a member of all industry associations and should attend all functions, both social and professional.

The company should enhance its perceived level of expertise as well as renew contacts by mounting technical seminars - perhaps only once a year. The seminars should be innovative, of a high technical standard and mounted at a venue with excellent facilities using speakers from the academic world.

The regular publication of a newsletter, which is disseminated within the industry could be considered as it would keep H-V at the forefront of customers' minds and improve the company's image. A newsletter does not need to be more than four sides of A4, providing it is of high quality. To be read, it must concentrate on matters of interest to its audience. The long term return from a good newsletter should be far greater than that from an equivalent sum of money spent on advertising or direct mail.

7.5 SALES AND MARKETING ORGANISATION

The sales and marketing organisation consists of 43 people under the direction of the Marketing Manager and is shown in Appendix 5. The Marketing Manager reports to the Marketing Director under whose control also comes the manufacturing activities.

The Marketing Department is divided into three major areas entitled:

- 1 Planning and Market Search;
- 2 Despatch and Sales; and
- 3 Export.

7.5.1 Planning and Market Search

This section also encompasses the functions of: product management; sales and distributor management; promotion, (which is discussed in section 7.5.), prices and costs; and reporting to other departments.

7.5.1.1 Product Management

There are 5 product managers covering the following products.

- 1 Submersible pumps, vacuum pumps and blowers.
- 2 Self priming, chemical, circulating and centrifugal pumps.
- 3 Shipyards and ARPO.
- 4 Others, such as drinking bowls, kitchen stoves, baths and enamel tiles.

ARPO is a nationwide pump distribution network and in 1991 H-V sold 13% of their total pump production through this network representing £1.25M of sales. ARPO has a chain of shops all over Poland, warehouses in Gliwice, Zyrardow and Grutziadz as well as its own transport.

The product managers are office bound and cover the activities of technical support, customer enquiries, quotations and telephone contact with customers and distributors. There are thoughts to change the role of the product managers to provide more direct sales support to distributors by giving them each the responsibility for a number, and ensuring that each has the capability of providing the necessary product support for the whole range of products.

7.5.1.2 Distribution

H-V currently uses 22 distributors, 8 stockists and one exporter/importer in Poland.

It is important to realise that, due to privatisation, the number of customers has increased from 100 to 3,000 over the last 3 years. Hence, there is a need to develop a strong and effective nationwide distribution network to serve this proliferation of customers as professional salesmen are impossible to recruit or train in the short term. There is also a need to create new distributors as prior to privatisation they were state owned or did not exist.

H-V have plans to develop a distribution chain on a regional basis, whereby 5 main distributors are served directly by H-V and provide after sales service, while the stockists and other distributors purchase from the main distributors. Management of the distribution network is undertaken by one person and the employment of a salesman to undertake all sales visits, training etc. would provide the distributors and their sales people with the support they need.

There is no formalised reporting system to and from distributors and stockists, to provide product and/or market information. Questionnaires are prepared from time to time by the marketing department and sent to major distributors and major users, but certainly not on a regular basis. There is no formalised collection of market forecast requirements from distributors. Reports which are prepared on a monthly basis by stockists and distributors are solely based on sales made in a period and by product group. Such information which is provided goes to H-V's accounts department and the marketing department receives copies only if they ask.

Agreements with distributors and stockists do not provide them with any geographical exclusivity. Nor do the agreements state that distributors and stockists must not stock competitors products. This is a policy of H-V as they have adopted a strategy of low pricing which should prevent them stocking others products.

It should be realised that any formalised reporting system needs time and manpower to be put into effect, which, at the moment is done on an informal basis face to face. The employment of a salesman would assist in the programme of identifying, selecting, appointing, training and motivating distributors and their sales people.

7.5.2 Exporting

The Export Department consists of two persons reporting direct to the Marketing Manager. It has been newly created, as export sales to markets such as Germany (for agricultural feeding bowls), and the USSR for bore hole pumps had, until December 1991 been conducted through the Foreign Trading Organisation of VARIMEX and POLIMEX.

The staff have been undertaking the following tasks:

- reestablishing contacts with other markets;
- making comparisons with competitors SIHI, GRUNDFOSS, SALMSON etc.;
- processing enquiries, quotations, orders;
- promoting H-V by mailshots to chambers of commerce, trade delegations and embassies, and ensuring entries into relevant directories; and
- endeavouring to collect (with minimal success), foreign standards such as DIN, ISO, EN. This has not included obtaining copies of EC Directives.

The above has been conducted within a worsening domestic and world economic climate, increased competition, a breakdown of established foreign markets and non existent government export support facilities.

The newly independent former Soviet states such as Latvia, Estonia and Byelarus are demanding that purchases made from H-V be conducted on a barter basis using timber as the commodity. Trading this in Western markets may provide the necessary hard currency but it must be perceived only as a long term solution.

Approaches to those markets which could offer opportunities to H-V such as the Middle East have been disappointing as:

- pumps need to be diesel or natural gas engine driven;
- pumps need to be able to pump water containing sand and even dirty water; and
- more opportunities exist in developed markets for dewatering sludge and effluent treatment than for pumping clean water.

The above emphasises the need for the development of a market screening exercise based upon product need and acceptability, country credit worthiness and the ability of H-V to service the market identified, and the consequent development and implementation of the correct market entry strategies.

7.5.3 Despatch and Order Processing

These functions also include transport, packaging and the raising of invoices and are primarily concerned with the delivery to customers and factory shops of finished products and spare parts. Any problems in the short fall of quantity or quality of products are also channelled through this department. Efficiency has increased enormously over the past 2 years as the number of complaints in this area has dramatically fallen from 67 in 1989 to 4 in 1991.

7.5.4 Marketing Information

Within H-V's current marketing department structure, no person is allocated the vital exercise of collecting, assimilating, analysing and distributing up to date marketing information. Within the proposed new organisation this fault is rectified.

The availability of suitable marketing information is an essential ingredient of a marketing led organisation. Decisive action must be based on adequate information and in this respect there are a number of improvements that H-V could make.

7.5.4.1 Data Base

The most urgent need is the establishment of a customer data base. This should initially concentrate on the water providers and should be comprehensive, listing all the possible influencers in all water

providers in Poland. Once established, it needs updating on a continuous basis and other segments to be targeted by H-V (e.g. the food and process industries) could then be added.

7.5.4.2 Key Indicators

The marketing department does not need information for its own sake, but it does need to agree on a small number of key indicators upon which the marketing performance of the company and the department can be monitored. These indicators should form the basis of discussion at monthly management meetings.

The following list is indicative and would need to be refined. All figures should show performance for the latest month, year to date and against budget.

a) **Overall performance**

Orders, total and by:

- products spares;
- service;
- market segment; and
- order size.

Orders, number, value

Order book/delivery time

Quotation conversion rate

Lost order analysis

b) **Promotion performance**

Promotional activities (eg advertising, mailshots) against schedule

Number of leads generated

Source of leads

Number of leads followed up

Number of cool leads - action

Number of qualified leads passed to salesforce

Source of qualified leads

- c) Field sales performance**
Number of visits
Average call rate per man-day
Visits by segment
Number of visits to new prospects
Number of qualified leads visited
Customer/prospect visit ratio
Number of new accounts
Source of new accounts
- d) Internal sales performance**
Enquiries, number, value
Quotations, number, value
Quotations backlog, number, value
Quotations on time, number, percentage
Number of quotations followed up
- e) Customer service performance**
Number of quotations late
Due delivery date performance for:
- products;
- service; and
- spares.
Customer complaints (number and category)
- f) New Product Development (NPD) performance**
Performance against NPD schedule
Research next month
Research results
- g) Export performance**
Overall performance indicators as in (i)
Number of visits
Promotional activities against schedule
Key market activities and results.

Two beliefs underpin the list of key performance indicators and their discussion at monthly management meetings. Firstly, each manager would have performance related objectives against which results can be monitored. In view of its importance, it is suggested that a senior member of the board initially take responsibility for customer service performance. Secondly, overall marketing performance is the sum of the performance of each department listed above. Those key indicators will pinpoint the source of any poor overall performance, and, in many cases will act as early warning lights, allowing specific areas of poor performance to be rectified before they seriously damage overall results.

As far as resources are concerned, such a system would require appropriate software. Standard software of this nature is now available but a bespoke H-V system programmed inhouse would almost certainly be more satisfactory in the long run. Moreover, it is suggested that all managers above a certain level should take advantage of computers to improve their own effectiveness. Key managers should have their own terminals and should make full use of the new system as a working tool. Additional staff (perhaps as many as two people eventually), would be required to maintain the system.

As well as entering ongoing performance data, they would have responsibility for updating and expanding the customer database, carrying out the initial follow-up of new leads and the follow-up of quotations. This includes much work that is already being carried out (or should be), but does also include a significant element of new work, particularly for the customer database.

7.6 THE POLISH WATER INDUSTRY

This industry is an important future market for Hydro-Vacuum. We have discussed the industry in detail in Appendix 5.

7.7 CONCLUDING REMARKS

The management emphasis in H-V must be on developing a market-led company. Production should be made on orders only. Close contact must be maintained with clients and both domestic and export markets carefully cultivated. New products for which there is a market should be developed, and particularly close attention should be paid to the water and effluent treatment businesses.

8. THE IMPLICATIONS OF THE POLICY ENVIRONMENT FOR HYDRO-VACUUM'S INTERNATIONAL COMPETITIVENESS

8.1 INTRODUCTION AND BASIC FRAMEWORK

This chapter is intended to provide corporate planners within H-V with an understanding of the effects on their competitiveness of the structure of economic incentives in the Polish economy. It is also designed to quantify the economic efficiency of H-V for the benefit of trade and industrial policy makers, who may be concerned with how best to allocate scarce investment resources. Of principal concern is Poland's trade policy in the form of the tariffs levied on imports of both H-V's outputs and raw material inputs.

The analysis which follows quantifies the effect of the policy regime on H-V's international competitiveness. The appraisal is based on a comparison of the price differential between H-V's production and the production of overseas competitor companies for a sample of products drawn from H-V's major product lines. The differential observed is then directly related to the levels of import tariffs levied on the inputs to and outputs of manufacturing industry.

In order to assess how H-V is affected by the structure of incentives in the Polish economy, four major quantitative techniques are employed. These are: nominal and effective protection analysis, the appraisal of anti-export bias, the analysis of domestic resource costs and the analysis of price competitiveness indices. These techniques are explained in brief here, but are set out in more detail in Appendix 6.

8.1.1 Methodology

8.1.1.1 Nominal Protection Analysis

If there were free trade and no distortions to production and consumption, the domestic price of a good would equal its international price. It follows that comparing domestic and international prices provides an indication of the impact of policy and non-policy distortions on domestic prices and hence competitiveness. Policy distortions include those such as tariffs, subsidies, and quantitative import

restrictions and price controls. Non-policy distortions include natural protection and illegal imports. The amount that domestic prices exceed international prices represents the nominal protection provided to domestic producers. It can be used therefore to indicate the extent that Government policy subsidises domestic producers and taxes domestic consumers. Producers are subsidised because protection allows them to maintain higher production costs and/or profits than under free trade. If this competitive "cushion" is in place for long enough, the ability of domestic enterprises to compete on international terms may be seriously affected, (as enterprises have been consistently operating at costs in excess of those required to compete on international terms). In addition, consumers are also taxed because they have to pay higher prices for consumption goods, reducing their real incomes.

The nominal rate of protection (NRP) can be defined as follows:

$$\text{NRP} = \frac{p^d}{p^w} - 1$$

where P^d and P^w are domestic and world prices respectively.

Data limitations have meant that NPRs have only been estimated for H-V's outputs. A nominal tariff rate, based on scheduled tariff rates has been used for imported inputs.

8.1.1.2 Effective Protection

The effective rate of protection (ERP) is an extension of the NPR concept and summarises the net effect of the incentive structure on the value added for a particular product. It compares value added in domestic prices with value added at border prices. ERPs identify the extent that the incentive structure allows domestic producers to increase their value added (i.e their profit margins) above that achievable when inputs and output are valued at border prices.

Increased domestic value added allows domestic producers either to make greater profits and collect higher rents or have higher production costs than would be the case without protection. Analysis of ERPs gives an insight into the effect the incentives have at the enterprise level. ERPs are affected by both the policy environment and enterprise specific factors such as the structure of labour cost, the degree of material import dependence and the technical characteristics of production.

In essence therefore, effective protection analysis goes one stage further than nominal effective analysis in that, through its appraisal of value added, it assesses the effect of import tariffs on an enterprise's inputs as well as outputs. As a result it analyses the effect of the policy environment on the entirety of the production process of an enterprise such as H-V. Moreover, effective protection analysis focuses attention on the possibility of negative effective protection, whereby tariffs on intermediate, imported inputs may be sufficiently in excess of those on the final good so as to disprotect the activity. Finally, there is the possibility of zero or negative world value-added in some activities. This occurs when the cost of intermediate inputs exceeds the value of the final product when both are valued at world rather than distorted domestic prices. Evidence of this is a strong initial guide at least to the net costs of excessive or inappropriate protective structures; i.e. to the maintaining of activities domestically which are uncompetitive internationally.

8.1.1.3 Anti Export Bias

Following on from the ERP analysis, a measure of anti-export bias has also been calculated for H-V. The definitions of anti-export or trade regime bias that are most widely accepted relate to the pattern of relative incentives that apply in a given economy. Indeed the definitions of trade regime bias and trade strategy can be determined simultaneously. The technique assesses whether the trade policy followed is import substituting or export promoting, and the direct affect this has on the experience and likely success of Polish enterprises in export markets.

A trade strategy based upon import substitution (IS) is one which provides a pattern of relative incentives that draws resources into the domestic production of importables and away from the production of exportables and non-tradeables. The incidence of trade regime bias is determined therefore by the extent to which policy interventions result in disincentives to export. This is done as an extension of the effective protection analysis, and is described in detail in Appendix 6.

8.1.1.4 Domestic Resource Costs

A brief consideration of Domestic Resource Cost (DRCs) is also provided. These are essentially measures of economic (and not financial) efficiency, of principal interest to the policy maker. In addition they can provide useful insights to the corporate planner as to the underlying competitiveness of an enterprise. They contrast the economic values of the domestic primary factors

(i.e., capital and labour) used in production with value added at world prices, which is notionally equivalent to the returns that would be realised by labour and capital internationally. In one sense, this measures the value of domestic resources used in saving or earning foreign exchange.

For the purposes of this analysis two types of DRC estimates are reported: a **Short Run DRC** which measures domestic resources in terms of labour and implicitly assumes that past investment embodied in the capital stock represents "sunk costs"; and **Long Run DRC** estimates that reflect both capital and labour costs. In both cases labour costs are adjusted to reflect the shadow price of labour which would differ from the market wage due to limitations to competition, (e.g., minimum wage regulations and union actions that increase wages) and differences in sectoral labour productivity. Similarly capital costs are adjusted to reflect the economic discount rate and the value of the marginal product of capital investment.

8.1.1.5 Price Competitiveness Indices (PCIs)

Similar to the DRC indices, PCIs (which are listed in Table 8.1), are useful for both the corporate and national planner to understand more fully how the policy environment is affecting the underlying competitiveness of a single or group of enterprises.

The first index (PCI_1) is largely a benchmark measure, measuring the domestic price of a particular good in relation to world prices. Both prices are actual current prices such that PCI_1 is given as:

$$PCI_1 = P_d / P_w$$

where P_d is the domestic price of a particular good and P_w the world price.

However, any particular price can be treated, under certain assumptions, as the sum of a number of component elements. Specifically these elements are traded inputs (T_d), non-traded inputs (N_d), labour costs (L_d) and capital costs (including normal profit) (K_d). These different components can be gradually revalued at world or at shadow prices to provided adjustments of the domestic price (P_d).

These adjusted or "notional" domestic prices are, then, a measure of the domestic price that would be likely to prevail in the absence of distortions in the particular input market. They directly reflect therefore how the policy environment is affecting enterprises' international cost competitiveness.

The first index (PCI_1) is largely a benchmark measure, comparing the current domestic price of a good with the current world price.

The second of these measures (PCI_2) seeks to eliminate the effects of interventions in goods markets by revising tradeable inputs and the tradeable component of non-tradeable inputs at world prices. This measure, therefore, assesses the likely degree of competitiveness that would prevail in the absence of direct distortions in tradeable goods markets.

The third measure (PCI_3) extends this revaluation procedure to isolate the effects of labour market distortions alone. Thus, PCI_3 varies from the benchmark of actual price competitiveness (PCI_1) only by the revaluation of the labour component.

The fourth measure (PCI_4) similarly revalues the benchmark measure of PCI_1 to reflect only the effect of capital market distortions. And lastly the final measure (PCI_5) adjusts domestic prices to reflect distortions to both factor markets and in tradeable goods.

This last measure, as with all the price competitiveness indices, provides an inverse measure (the higher the less competitive) of the likely competitiveness of Polish, (in this case H-V's) production in the absence of distortions.

8.2 INTERPRETATION OF THE RESULTS

8.2.1 Introduction

Table 8.1 below summarises the results obtained for the H-V pump making enterprise and reports Nominal Rates of Protection (NPRs), Effective Rates of Protection (EPRs), Domestic Resource Cost (DRC) coefficients; indexes of Anti-export Bias and Price Competitiveness Indices (PCIs).

The results have been generated using price comparison data (between H-V and least-cost overseas competitors), as the basis of the analysis, as well as import tariff information. In the case of conventional protection analysis, the basis of calculation is the import tariff rates on inputs and exports and it is assumed that the price of goods in the domestic market is directly controlled by

movements in the levels of these import tariffs. Although this is generally true, it need not always be the case. And indeed this is illustrated by the example of H-V itself.

Table 8.1

SUMMARY OF THE NOMINAL AND EFFECTIVE RATES OF PROTECTION ANALYSIS

MODEL RESULTS

	NPR	DOMESTIC ERP (ERP1)	EXPORT ERP (ERP2)	ANTI-EXP BIAS (EXP/DOM)	SDRC	LRDR	PCI-1	PCI-2	PCI-3	PCI-4	PCI-5
SIMULATION 1 (Based on Import Tariff Schedule)	15.00%	17.26%	-15.97%	71.86%	0.44	1.34	115.00%	110.78%	111.10%	126.37%	115.13%
SIMULATION 2 (Based on Price Comparison Data)	-22.11%	-48.88%	-10.08%	175.91%	0.24	0.73	77.60%	62.98%	65.93%	93.32%	64.76%

8.2.2 Interpretation of the Nominal Protection Rate

Table 8.1 summarises the results of the analysis in this chapter, whilst the raw data, the assumptions and conversion factors used are reproduced in Appendix 6.

It is often assumed in nominal protection analysis that the nominal rate of protection (and hence the domestic price) of the good/goods in question will equal or exceed the nominal tariff rate. For example if the nominal tariff rate of cement is 15%, it is likely the nominal protection rate will equal or exceed 15% due to the price raising effect of the tariff rate itself and the tariff equivalent price raising effect of any non-tariff barriers that may also be in operation.

This causal relationship between raised import tariffs and raised prices of domestic producers selling to the domestic market is in general a valid one arising as domestic producers elect to price up to the raised price level of imports. However the domestic enterprise actually faces two choices. The first and most commonly adopted is that the producer does indeed price up to the elevated import price. The domestic producer may in contrast, either fail to price up due to a poor comprehension of the domestic market, or consciously decide not to price up to the elevated import price, but instead to increase sales at a lower profit margin by undercutting the price of competing imports. It is evident from the price comparison data collected, this is the strategy adopted by H-V. Import tariff rates on all products produced by H-V currently stands at 15%; however far from selling at prices 15% or more in excess of the world price, H-V in many instances sells at significantly under the world price.

Indeed, as Table 8.1 shows, the average differential between H-V's prices and the world price of similar products (represented by the nominal protection rate) is -22.1%. This reflects the fact that H-V's products are on average* 22.1% cheaper than similar products produced by overseas competitors. However, within the product range, the price comparison data showed that there are very considerable differences in international price competitiveness by product area at H-V. For example vacuum pumps and submersible pumps were found in some cases to be as little as half the price of similar quality pumps produced by H-V's major overseas competitors whilst H-V's corrosion resistant pumps were found to be approximately 11% more costly than similar goods produced overseas. These differences in price competitiveness amongst H-V's product lines clearly have implications for the development of H-V's corporate planning strategy. Consequently they are considered and incorporated into the recommendations outlined elsewhere in this report.

8.2.3 Interpretation of the Effective Rate of Protection

Four effective rates of protection are quoted in Table 8.1. Two of these refer to the measure ERP1 and two to the measure ERP2. ERP1 relates to the effective protection accorded to H-V on its sales to the domestic market, whilst ERP2 refers to sales to overseas markets. For each of these categories there are then two rates listed. The "tariff-based" rate refers to the expected effective rate of protection on the basis of the structure of import tariffs currently in place on H-V's inputs and outputs. The second refers to the "price-based" rate, based on the actual recorded product price differentials between H-V's output and world output.

As mentioned earlier what we have termed here the tariff-based effective rate of protection represents the "net" level of protection accorded to H-V, bearing in mind it receives wind-fall gains through protective tariffs on its products, but must bear the increased cost of the import tariffs (and resulting protection) on the inputs it purchases during the production process.

- * The analysis was undertaken on the basis of direct price comparisons between vacuum pumps, corrosion resistant pumps, and submersible pumps and an extrapolated price differential for all the other products produced by H-V on the basis of a simple weighted average calculation.

As the table indicates the "tariff-based" rate recorded for sales to the domestic market (ERP1) is 17.3% which is relatively low, reflecting the fact that the tariff levels on both final goods and inputs are generally low. One would expect that owing to this net effective protection rate, H-V would have slipped towards a position of comparative international inefficiency as it has been able to "get away with" producing goods at 17.3% above the world price. However, this (as mentioned earlier) has not been the case as H-V has elected not to price up to the elevated import price for its domestic sales and has not in turn also therefore been susceptible to the encroachment of increased inefficiency in the production process.

This is reflected in the price-based effective rate of protection on domestic sales of -48.9%. As explained in the technical appendix, it is difficult to interpret the numerical value; however the fact that it is negative shows that despite tariffs on imports, H-V is still able to undercut world prices which is a further illustration of its underlying efficiency.

The tariff-based figure for the ERP2 measure is -15.97% which indicates that H-V is significantly disprotected in the context of exporting overseas. One would expect therefore for it to favour production for the domestic market rather than export markets not only due to superior market access and knowledge of the domestic market, but also due to the fact that the underlying structure of economic incentives are biased towards production for the domestic market.

8.2.4 Interpretation of the Domestic Resource Cost

It should be stated initially that DRC are most productively used as a means of comparing the relative productivity of a sample of enterprises or industrial sub-sectors. And hence the ranking of a DRC estimate relative to other members of the sample is often of more interest than the absolute value.

Clearly therefore, DRCs are of most use for industrial policy formulators concerned with assessing the relative economic efficiency of various industrial sub-sectors, rather than for individual enterprises interested in their own financial efficiency. However it is revealing to know whether the DRC estimate is greater or less than one, as this indicates whether H-V is economically efficient in that it would tend to generate more foreign exchange through the sale of its outputs, than it consumes through the consumption of its imports. H-V's tariff-based Short Run Domestic Resource Cost is 0.44 which indicates that H-V earns/saves more dollars in the value of its production, than it utilises through its consumption of domestic resources. H-V is therefore potentially efficient in earning foreign exchange, but being analysed in isolation, it is not possible to assess how efficient it is relative to other industrial enterprises and sub-sectors in Poland.

As Table 8.1 shows, the tariff-based Long Run DRC in contrast is greater than one (1.34), and hence when the "real" cost of capital is also taken into account, H-V emerges as inefficient in terms of foreign exchange generation/saving. However the figure is not very high relative to many other machinery sector enterprises Maxwell Stamp has analysed in other countries. And indeed there is typically a relationship between the levels of effective protection and DRC estimates - low levels of protection tend to ensure that activities are efficient while high levels of protection are usually necessary for inefficient enterprises to survive. The results for H-V are broadly speaking compatible with this assertion.

8.2.5 Interpretation of Anti-export Bias

As Table 8.1 indicates import tariff based, anti-export bias was estimated at 71.7%. A figure of 100% would represent a neutral trading environment, whilst a figure greater than 100% represents an incentive to export (i.e. an export bias). A figure less than 100% represents a situation of anti-export bias, with 0% representing the biggest possible disincentive to export. Bearing in mind the scope for inaccuracies due to the problems associated with the availability and reliability of the data the figure of 71.7% would confidently indicate that H-V is operating under trading conditions which offer significant disincentives to export. Thus despite having realisable international competitiveness as indicated by the analysis of comparative prices, (and indeed from the underlying assertions of the DRC analysis), the incentive still remains for H-V to supply the domestic market before export markets. An export oriented marketing strategy would therefore run contrary to the implicit structure of economic incentives prevalent in Poland.

However, anti-export bias is a measure usually employed to analyse the relative structure of incentives across a variety of sectors within an economy, in order to make recommendations about trade and industrial policy at the national level. It is not therefore ideally suited to the analysis of just one enterprise and the results obtained should be viewed as tentative only.

8.2.6 Interpretation of Price Competitiveness Indices

As previously mentioned there are five tariff-based PCIs reported and all are listed in Table 8.1. Of particular interest is the comparison between the tariff-based and price-based PCI results. As with the preceding analysis, the tariff-based PCIs are calculated on the basis of the current tariff structure facing H-V; whilst the price-based PCIs are calculated on the basis of the comparison between H-V's output prices and world prices.

Considering first the tariff-based results. PCI-1 is the benchmark figure, calculated in a similar way to the NPR and in this case indicates that under the current structure of incentives in Poland, H-V's products would be expected to be priced 15% in excess of the world price. In fact, as the price-based PCI-1 illustrates, H-V is producing at 22.11% below the world price (i.e. at 77.89% of the world price). This differential indicates that H-V is producing substantially more efficiently than would be expected in the context of the economic environment in which it is operating.

Turning to the measure PCI-2, which seeks to adjust for distortions in the markets for tradeable inputs, it can be seen that such distortions have, on balance, a significant effect on price competitiveness. The tariff-based figure of 110.78% indicates that in theory H-V's production would improve its competitiveness to a small extent, but remain uncompetitive in absolute terms, in the absence of direct distortions in tradeable goods markets. The improvement in competitiveness would come as the removal of protection on those activities which supply H-V with inputs would be expected to lower its input costs. However, the price-based figure of 63% shows how in practice H-V, instead of being marginally competitive if its input markets were undistorted, would in fact be highly competitive.

What is evident therefore is that H-V's ability to compete in international markets would be further enhanced by the liberalisation of the sectors which provide it with its raw material inputs.

The measure which seeks to isolate the effects of labour market distortions (such as minimum wage legislation and cross-sectoral wage bargaining) - PCI-3 - suggests that a reduction in such distortions would in theory improve the competitiveness of H-V's operations. The tariff-based and the price-based figures in this context indicate merely the absolute level of international competitiveness that is likely to be achievable should the labour market be liberalised in Poland. The data based on tariff rates (i.e. the tariff-based figure of 111.1%) suggests that under these conditions H-V would be marginally uncompetitive in international terms. However the price-based analysis indicates that in fact H-V's competitiveness would improve significantly, to the extent that it would become very competitive in international terms should the Polish labour market be liberalised. As would be expected therefore, labour market distortions do alter competitive performance.

PCI-4 adjusts capital costs at their shadow price effectively revaluing the benchmark measure of PCI-1 to reflect only the effect of capital market distortions. Relative to the PCI-1 benchmark, the shadow pricing of capital appears to reduce price competitiveness under both the tariff-based and price-based analyses, as the PCI-4 emerges as 126.4% which is greater than the PCI-1 of 115%. This directly reflects the fact that profitability is "artificially" increased under conditions of domestic protection, as sales prices achievable increase.

The final competitiveness measure PCI-5, adjusts for all distortions. As Table 8.1 shows, under this scenario, the tariff-based measure becomes 115.1%, which is superior to the PCI-4 figure but less favourable than the other three tariff-based indices. A similar relative pattern is evident under the price-based analysis, however all five indices are less than 100% indicating overall international competitiveness under all the scenarios. This would corroborate the evidence of competitiveness revealed from the price comparison data, and reasserts the viability of H-V actively competing in international markets.

8.3 SUMMARY AND RECOMMENDATIONS

It is evident (under both the tariff-based and price-based analysis) that H-V is not operating in a highly protective environment relative to many other countries Maxwell Stamp has studied. The tariff-based and price-based ERPs of 18% and -22% respectively indicate that even though H-V is operating behind a limited protective barrier it is resisting the incentive to relax efficiency and allow prices to rise to the protected level of 18% above world prices. Instead it maintains price levels 22% below world prices. This is highly uncommon and would indicate that H-V is in a potentially positive position as regards significantly increasing its market share overseas (should it be able successfully to alter its product specifications to meet overseas markets' standards).

In summary therefore the following observations have emerged from the analysis in this chapter. Some observations are of relevance to the corporate planner and some are of relevance to the policy maker at the national level. Considering first the former.

Firstly it is unclear why H-V has not priced up to the levels permissible in the domestic market. H-V is currently selling many of its products at well below world (and hence also domestic) prices. This may on the one hand be as a result of a conscious strategic decision to increase sales volumes at the expense of profit margins. Or in contrast it may be unintentional and due to a poor understanding of

the domestic market or indeed, due to a quality differential between H-V's products and the products of its competitors, (which is in fact refuted by the fieldwork carried out by the Maxwell Stamp marketing specialist). We recommend therefore that H-V's domestic pricing policy be reviewed as soon as possible.

Bearing this in mind, the following factors are also of interest directly to H-V strategic planners.

- Despite the handicaps imposed by the current policy regime in Poland, H-V is generally internationally competitive as is shown by the differential between the tariff-based and price-based NPRs, though the degree of competitiveness varies substantially by product type.
- Hence further emphasis should be placed on an export marketing strategy, particularly for submersible pumps, circulating pumps and vacuum pumps. The exact nature of this strategy should be determined in large part by the analysis of overseas markets to determine which are most dynamic and conducive to long term sales growth.

In addition the nominal and effective protection analysis has revealed several factors of principal interest to the policy maker, but also of relevance to Pomorska itself.

- Firstly H-V is much more internationally competitive than would be expected in the context of the economic environment in which it operates (as is reflected in the price-based and tariff-based NPR and EPR coefficients).
- Second, as H-V is producing many products at below the world price it is in the position to increase substantially its exports, despite the anti-export bias inherent in the Polish economy, as is quantified in the tariff-based Anti-export Bias figure of 66.4%. This is a credit to the management capabilities of H-V itself.
- Third, H-V is economically efficient against the benchmark of net foreign exchange generation. The tariff-based Short-Run DRC of 0.44 illustrates this. H-V's efficiency at generating foreign exchange is called into question however if the domestic cost of capital is taken into account, (as is shown by the tariff-based Long-Run DRC of 1.34).

- Fourth, H-V underlying economic efficiency is further underlined by the tariff-based PCI analysis. Moreover this analysis identifies the factors of production which most significantly affect H-V's efficiency. These are found to be traded goods (i.e. raw material inputs) and labour, with tariff-based PCIs of 91% and 95% respectively, which are comparable to the tariff-based PCI-1 of 115%. The figures indicate therefore that the liberalisation of the sectors supplying H-V with its material inputs would significantly improve its competitiveness (as input prices would fall); and so too, to a lesser extent, would the liberalisation of the Polish labour market.

One further comment is necessary. Owing to limitations with the data, especially as regards the shadow price of non-tradeables, these results must be viewed as tentative. Indeed, at very least, during this current period of rapid policy development in Poland these measures should be monitored on an ongoing basis, in order to understand the implications for H-V's activities. This is particularly true in the light of the decision to embark on new tariff reforms in an agreement with the EC in March 1992.

9. ANALYSIS OF COMPETITORS AND THE MARKETS FOR PUMPS

This chapter concentrates on the market for pumps, as information is not readily available on hydrophones and castings, which anyway are of secondary importance to H-V.

9.1 THE DOMESTIC MARKET

9.1.1 Production

Current domestic production of impeller pumps similar to the kind produced by H-V is not available in official statistics. The production figures are calculated from examining statistics from individual companies. This information is confidential and access requires corporate consent.

Impeller pumps, such as those produced by H-V, are statistically aggregated together by the Polish Central Statistical Office under the name "pumps and other liquid conveyors", which effectively means all industrial pumps produced in Poland. Currently there are 28 companies producing such products. The production levels are listed in the following table:

Table 9.1

PRODUCTION PUMPS IN POLAND, 1986-1990

Year	1986	1987	1988	1989	1990
1000s produced	359.1	245.1	309.5	363.4	186.0
Production relative to 1986	100.0	98.1	88.0	80.5	52.9

Source: Central Statistical Office

Production from foundries in Poland also declined sharply from 1.43 million tonnes in 1987 to 0.89 million tons in 1990, for cast-iron foundries. Over the same period output of steel foundries fell from 285,000 tonnes to 179,000 tonnes. (Data from the General Statistical Office.)

9.1.2 Domestic Competition

All H-V pumps are manufactured entirely by the company and it is the only exclusive manufacturer in Poland. In certain configurations, the purchaser has the option to receive domestically produced

pumps either of similar or different design for the same designated purpose. The main domestic impeller pump manufacturers, and their products that could be substituted for H-V products are as follows:

1. Leszczynaka Pump Factory - deepwell and centrifugal pumps.
2. Pipeline Equipment Manufacturing Plant in Mława - self priming pumps.
3. Kielce Pump Factory "BIALOGON" circulation pumps.
4. Zabrzanska Mining Equipment Factory "POWEN" - single stage and flood pumps.
5. Gliwic Technical Equipment Plant - marine and single stage pumps.
6. Specialized Low Powered Electrical Machine Company in Wrzesnia - hermetically sealed circulating pumps.
7. Chemical Equipment Plant "TOFAMA" in Toran - single stage pumps.
8. Warsaw Pump Factory - single stage pumps.

9.2 H-V's POSITION IN THE DOMESTIC MARKET

The latest available data on different types of pump production in Poland are for 1986. At that time, H-V accounted for over 40% of the total Polish impeller pump production, and had a near monopoly in certain types, such as deepwell and self-priming pumps. The main pump manufacturers then produced the following:

Table 9.2

IMPELLER PUMP PRODUCTION (along with hydrophones), 1986

	1000 Units	%
1. Hydro-Vacuum Casting and Foundry	102.2	40.1
2. Leszczynaka Pump Factory	60.0	23.6
3. Pipeline Equipment Manufacturing Plant	51.0	20.0
4. "BIALOGON"	16.0	6.3
5. "POWEN"	12.5	4.9
6. Gliwic Technical Equipment Plant	4.4	1.7
7. "MIKROMA"	3.5	1.4
8. "TOFOMA"	2.7	1.1
9. Warsaw Pump Factory	2.1	0.8
TOTAL	254.2	100.0

In 1986 production in the above mentioned factories did not cover the needs of the Polish market, while the planned growth was for a 30% production increase through 1995. In 1989 the situation was reversed - initial production declined due to sharply reduced demand, initially from industrial customers, and then from individual customers as well. By 1991 H-V was producing less than half the number of pumps it produced in 1989.

All of the above named pump manufacturers are still operating, either as smaller or larger competitors to H-V. As mentioned earlier, the exact 1991 production statistics for impeller pump types are not available.

The directors of H-V, along with evaluations by the Testing Institute for Industrial Pump Development in Warsaw, estimate H-V's sales position of specific types of impeller pumps on the domestic market as follows:

PUMP TYPE	APPROXIMATE DOMESTIC MARKET SHARE
Deepwell pumps	80%
Self-priming pumps	60 - 70%
Centrifugal pumps	10%
Vacuum pumps	20 - 30%

H-V is one of the main hydrophone producers in Poland. They are sold as a separate product line or along with pump supplies. The H-V market share is estimated to be over 50%. The second placed manufacturer is the Pipeline Equipment Manufacturing Plant in Mlawa with about 40% of the market.

9.3 IMPORTS

9.3.1 Level of Imports

The official statistical data regarding Polish foreign trade up to 1990 included only imports of state owned-foreign trade enterprises. Starting from 1991 official statistical information includes private imports as well.

The level of state imports of impeller pumps in period of 1988-1991 is presented in the table below. The annual level of imported impeller pumps, up to year 1990 has been estimated at 50-60000 units. Starting from 1991 the majority of this import was executed directly with representative offices of foreign producers. In 1991, the value of imports of impeller pumps was US\$ 1.37 million, according to the General Statistical Office. Exports for the same year were estimated to be \$71,921.

Table 9.3

IMPELLER PUMPS IMPORT TO POLAND 1988 - 1990

(in units)

Country	1988	1989	1990 (9 months)	1991
Eastern Europe of which:	50481	56717	20669	599
Czechoslovakia	18237	27156	20302	584
East Germany	30683	28960	80	-
Western Europe of which	2265	2842	30633	3028
Denmark	104	66	83	35
France	92	72	33	16
Germany	637	627	29404	2109
Great Britain	343	56	162	27
TOTAL	62746	59559	51102	3627

9.3.2 Foreign Competition

The main foreign competitors producing impeller pumps and related products found on the Polish market that compete with H-V pumps are:

1. "GRUNDFOS" Denmark - deepwell and circulating pumps
2. "SALMSON" France - deepwell and circulating pumps
3. "VILLO" Germany - circulating pumps
4. "SIGMA" Czechoslovakia - deepwell, self-priming and centrifugal pumps
5. "RITZ" Germany - deepwell pumps
6. "KSB" Germany - deepwell pumps
7. "PLUEGER" Germany - deepwell pumps
8. "Pb ODESSE" Germany - self-priming and deepwell pumps
9. "APOLLO" Germany - self-priming and deepwell pumps
10. "VOGEL" - deep well pumps

The imports of the different pump types are estimated to be:

PUMP TYPE	PERCENTAGE OF TOTAL IMPORTS
Deepwell pumps	10%
Self priming pumps	10-20%
Circulating pumps	50%
Hydrophones	10%

9.4 THE EUROPEAN MARKET

9.4.1 Introduction

We have attempted to compare prices of western pumps to similar pumps made by H-V. It is not correct to assume that pumps of different manufacturers are directly comparable because the basic technology has been long established the world over. Comparable products are scarce, because of historical differences in the markets in Poland and the West. We will therefore examine these differences.

9.4.2 History

In the west, as in Poland, when the population was rural and sparse with modest daily per capita water requirements, a well (either hand sunk and bucket raised or in a few cases driven and artesian), was within local reach of most people. The earth provided enough filtration when pollution was minimal.

The Industrial Revolution, which started in England and spread to western Europe and America before Poland had two profound effects:

- (i) The new industrial processes (for example textiles and paper) and the consequently urbanised population sharply increased the demand for water in concentrated areas which also suffered more pollution.
- (ii) Civil engineering technology became available for using the surface water available from the fast flowing rivers caused by natural land gradients while the steam engine (more manageable on a large scale) became available for the plains not having a natural delivery head.

These two factors produced a preference for centralised collection of surface water (or extraction in the exceptional case of London) and centralised processing. For example reservoirs were constructed in the mountains of Wales to supply industrial Birmingham in England.

In contrast Poland, successively occupied and politically exploited, has remained rural far longer with a widely distributed population. The plains in the northern and central populated areas provided water sources in underground aquifers and the invention of the electric motor (highly manageable on a small scale) facilitated local pumped boreholes.

Since the 1960s the west has developed a sophisticated system of food and drink processing and distribution. This has given rise to a whole range of specialised hygienic pumps, the demand for which is in its infancy in Poland.

Again as a result of greater urbanisation and industrialisation the west has, to a greater extent legislated for pollution controls particularly since the 1970s. Not only have the chemical, dyestuffs, cleaning and food processing industries become more chemically diverse, but also an increasing number of chemicals are recognised as harmful. Therefore there is an increasing range of pump materials and coatings to withstand attack by the pumped product and rapid innovation in seal technology including seallessness. For example one manufacturer, Rheinutte of Wiesbaden, offers fifteen non-corrosive materials including zirconium, tantalum and titanium.

Pollution control has also directly created a demand for sewerage and other effluent treatment including its pumping.

9.4.3 The Pump Industry

In the west the industry is very international. Pumps of USA design have been licenced to European licensees, who on the expiry of the patent, have introduced near imitations. Against the background of similar market needs and similar products, standards have been agreed by Britain, Western Europe and USA concerning chemical levels.

Poland throughout the cold war has been very largely excluded from this technological dialogue. Therefore it is not surprising that their products have diverged. In addition, it is unlikely that H-V will happen to have products for a need which western manufacturers have overlooked. Moreover, the turnkey system industry expects product offerings to fall into the categories they have grown to expect and around which they design their systems.

9.4.4 Methodology

Nineteen companies were approached by telephone, each of which produces one or more of the following product range:

	H-V	(Borehole)/ Discharge	Flow inches	Head m3/hM
	Ref	Dia		
Borehole submersibles	GA to GF	(4-14)	1-360	10-425
Multistage selfpriming	SK	1.1/2-2	5-30	9-150
Chemical resistant	KS	2-2.1/2	6-36	7-45
Vacuum/blower	PW/DW			
Centrifugal close coupled	-			
Centrifugal multistage single entry	-			

Those selected included certain additional companies also listed in the Directory section of World Pumps August 1991 and the British Pump manufacturers' Association "Pumps from Britain" 4th Edition. The UK suppliers include those linked with many of the significant pump manufacturers in USA, Germany, Switzerland, Holland, Denmark and notably, Italy. Eleven had products comparable to H-V, to some degree, but usually with an only partially overlapping range. Eight were not at all comparable.

Only one manufacturer, Lowara, was prepared to send a price list, but it was possible to identify a product corresponding to one of H-V's for which a price could be identified. The remainder expect to quote an individual price when a pump and all its optional features have been selected. However price comparison is of limited interest as most products cannot be compared to H-V's products.

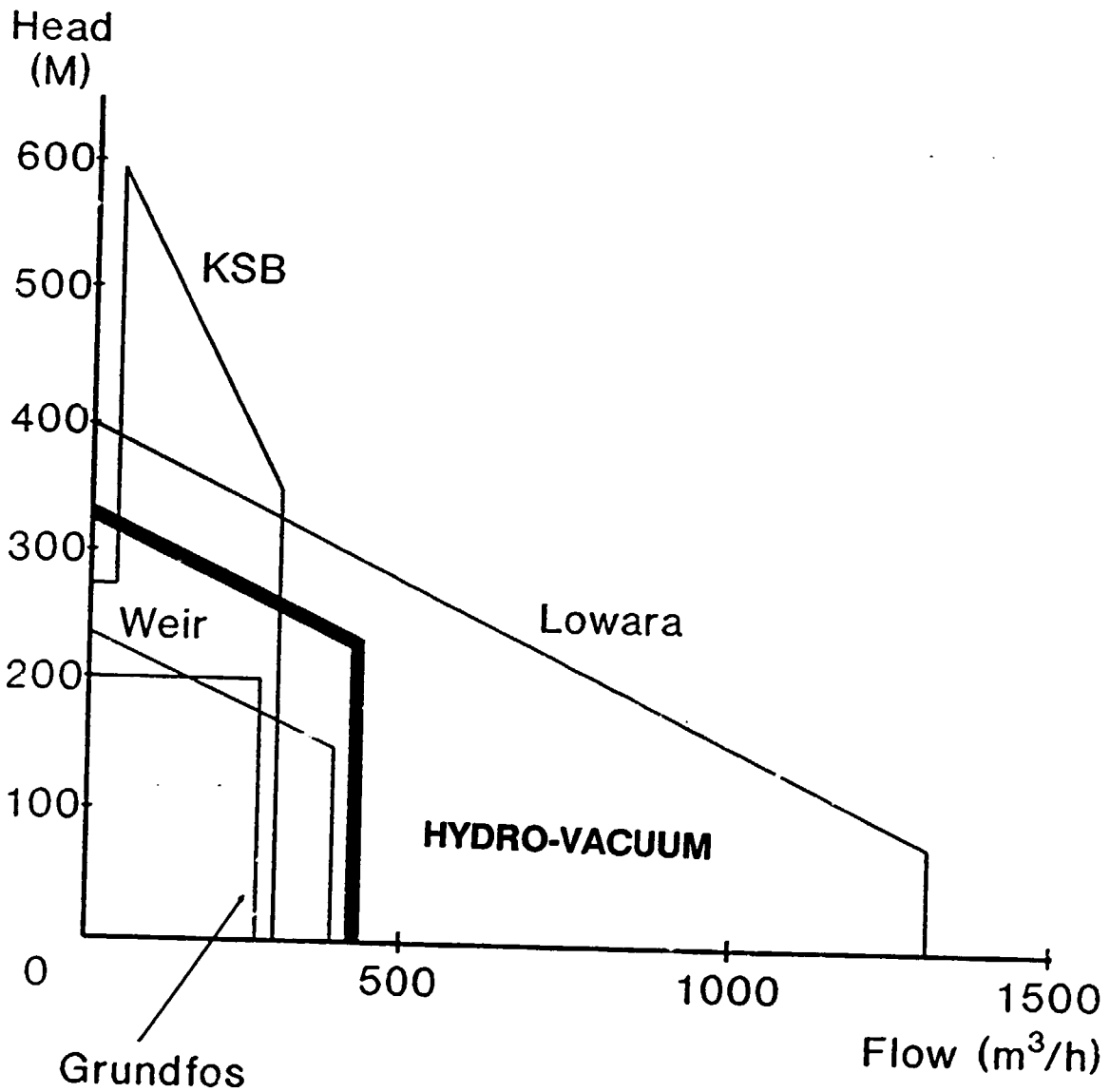
Where price comparisons were possible a pump of each make was selected with approximately the same flow (more specifically, a point near the middle of its range of flow), and where the head was near the maximum of its range. In this way cases were eliminated where the pump and indeed the motor would be unnecessarily expensive for the purpose in question. Detailed comparisons are included in Appendix 2.

9.4.5 Summary

Poland's water extraction is largely based on individual boreholes for each farm and local community. This is in contrast to the west which relies on centralised processing of essentially surface water. Apart from a small number of very large pumps for the above, the western market is dominated by a wide range of specialised pumps for environmental control (sewerage and air conditioning) and for food and other product processing.

Comparison of prices is difficult because of widely varying specifications. However, in the few cases where there is a reasonable probability that products are comparable, H-V's prices range from half to three times the best competitor's price, sometimes falling 10-15% either side. Details are provided in Appendix 2. Nonetheless, H-V's products generally appear to be competitive in price terms.

STRATEGIC PROFILE OF PRODUCT RANGE (BOREHOLE SUBMERSIBLE)



10. MANAGEMENT AND ORGANISATIONAL ANALYSIS

10.1 ORGANISATION OF MAIN FUNCTIONS

Pomorska's organisational structure consists of six major divisions. These are as follows:

Administration

- Personnel management
- Security services
- Computer services
- Legal services
- Social services

Quality Control

Marketing

- Planning, administration, distribution
- Selling
- Purchasing
- Transport

Production

- Planning, material control
- Production unit management (Z1 Z2 Z3)

Technology

- Product design and development
- Production engineering
- Metallurgy
- Tools, dies, patterns
- Plant maintenance

Finance and Economics

Appendix 4 contains the existing organisational structure.

10.2 HUMAN RESOURCES

10.2.1 Employment

Due to the state of the Polish economy and the decline of the company's markets in eastern Europe and the CIS, the company has had to make drastic changes in output levels, employment, products and markets. Total employment in H-V fell from about 4,000 in 1989 to 1,055 in December 1991. These were then deployed as follows:

Factory	Total Employees	Mgt/Admin/ Technical	Factory Workers	
			Indirect	Direct
Z1 - Grudziadz	413	302	23	88
Z2 - Mniszek	557	309	44	204
Z3 - Wabrzezno	85	14	37	34
TOTALS	1,055	625	104	326

Analysis of the 625 Management, Administrative and Technical staff shows the following:

Management and administrative services	116
Marketing and selling	46
Purchasing and stores	29
Transport	30
Production management and planning	20
Technical, plant maintenance, quality control and safety	283
Tool and die precision workshop	67
Finance and accounting	<u>34</u>
TOTAL	625

Despite the recent reductions in numbers employed the company remains heavily overstaffed for the current levels of sales. During 1992 it would be feasible to reduce total employees to about 550/600 people.

10.2.2 General Management

The Managing Director is young (32) and therefore relatively inexperienced in general management.

Nevertheless he has proved extremely capable in steering the company through the difficulties of the last 2 years since his appointment. He is supported by 3 main functional managers covering:

- Finance and Economics;
- Marketing (see below on Production); and
- Technology.

We referred earlier to one of the weaknesses in the present organisation structure, in that there is no senior manager responsible for all administrative functions in the company. The result is that six people, in addition to the three specified above, report directly to the Managing Director. There is a need to appoint (or promote and train) a suitable person to take over all administrative functions.

10.2.3 Finance and Economics

The main problem in this function is a problem related to Poland as a whole, in which there is no accountancy profession. The company should adopt Western standards and procedures in financial accounting. The head of this function is an Economist and there is a need for training in professional accounting practices. In view of the Managing Director's lack of experience in finance, this is a key post and should be upgraded and re-titled Finance Director.

Further, H-V needs to design and implement a new improved costing system as soon as possible. A qualified Cost Accountant should be recruited and he should be trained to work closely with the Computer Manager and the consultants on the implementation of cost control systems during 1992. This is a major undertaking, and the design and implementation of a comprehensive MIS is likely to take about 2 man years.

10.2.4 Marketing

It appears that most of the 43 staff in this department are desk bound at Head Office in Grudziadz. Only the departmental head, the Marketing and Sales Manager and Distribution Manager have any experience of direct selling activities away from the company.

A major weakness which restricts the company in attempting to develop markets in western Europe and elsewhere is in the lack of ability in languages in the company. This is particularly important in the Marketing Department where only one senior manager is fluent in English. Training in English and German languages is therefore a pressing need.

There is a need for training in marketing and sales for senior staff, covering both domestic and international markets. In general, there is a lack of knowledge, experience and the skills of marketing products in competitive markets.

10.2.5 Technology

This is a large, dispersed function of some 283 people. There appears to be a high standard of technical competence in all sections which are as follows:

- **Plant maintenance.** The Manager has a mechanical engineer and an electrical engineer in charge of each of two sections. The department is clearly overstaffed.
- **Design and Technology.** The Manager has a Head Designer and a Head Technologist.
- **Metallurgy,** with a test laboratory.
- **Tool and Die Workshop.**
- **Quality Control.**

10.2.6 Production

The other main weakness in the present organisation structure is that the head of the marketing function is also responsible for all production activities. The Chief of Production and his Planning Manager are clearly competent people. They should be directly involved in the process of sales and production planning so as to ensure that decisions are taken which are in the best interest of the company as a whole. A Production Manager should be appointed with direct responsibility to the Managing Director. Existing resources should enable this appointment to be made internally.

10.2.7 Factory Workers

In general, the skill levels of factory workers appear to be more than adequate for present needs. The reduction in numbers over the past 2 years has no doubt enabled the company to continue the

employment of higher skilled people in so far as it was possible to use them on appropriately skilled work. The system in Poland in which pay is based on a person's skill grade but in which he may be required to carry out less skilled work at a lower rate of pay has helped in this respect.

The numbers in some departments need to be reduced further to eliminate the need for workers to be sent home, at a rate of pay of 75% of normal, for some 30% of their normal working time.

10.3 MANAGEMENT INFORMATION BULLETIN

This consists of month and year to date reports on 30 sheets, produced by the 20th of the following month (for full details of the content of these information bulletins see Appendix 7).

With the exception of the financial information shown on the first seven report sheets, the data on the remaining reports should provide useful information for the management. In addition, in order to improve the quality and ease of comprehension of all relevant financial information, general financial information should be presented in the form of Western style accounts.

10.4 PLANS FOR PRIVATISATION

The government of Poland has passed a law where state owned enterprises are encouraged to become public joint stock companies. Some 900 firms were originally identified for privatisation and more recently 204 were listed in the press (including H-V) as most likely candidates. The previous government had approved 111 firms for privatisation and H-V appeared on a list of a further 28 firms approved by the new government, and become a joint stock company on 1 February 1992. The intention is that ownership of land and buildings of approved firms will be transferred to them, as they become companies as opposed to state enterprises.

The initial share allocation is likely to be:

Government	60%
Stock market	30%
Staff	10%

Full privatisation should be achieved within 2 years.

PART III

11. PERFORMANCE IMPROVEMENT POSSIBILITIES

11.1 COST OF PRODUCTION

The main cost savings available are labour costs and the reduction in costs as a result of concentrating production in one location.

11.1.1 Labour Costs

H-V may be able to reduce the work force from 1,050 to 650/700, or by about 35%. However much of the reduction is likely to be in the lower paid workers, so the wages and salaries bill will not fall pro rata. However, H-V is not able to reduce employment rapidly because of social and political conditions in Grudziadz. In Chapter 15 we assume that there will be a reduction of 20% (in real terms) in wages, salaries and payroll taxes in 1993 and 1994. Although this may appear to be a conservative estimate, it does leave room for some increase in real wages. The saving amounts to ZL 1,264 million per year.

11.1.2 Savings from Consolidation of Facilities

H-V estimates in its Business Plan of August 1991 that annual savings as a result of consolidation on one site will be US\$ 791,000. However this figure includes payroll savings of \$241,000 which is allowed for in labour cost savings above. It also includes savings of \$319,000 in heating and power. However this saving may be largely offset by the substantial increases in the real prices of energy in Poland. There is a further saving of \$72,000 in real estate taxes, but this assumes that H-V will be able to sell its unwanted land and buildings which is questionable (see 11.3). A further \$55,000 of saving on depreciation is included, which is not a real saving. Eliminating these items leaves savings of only \$104,000.

Given the small magnitude of this figure we have preferred to leave out these savings from our DCF calculations in Chapter 15. However, the results of the DCF exercise give very good rates of return even without these savings.

11.1.3 Other Savings

The company plan to install a new furnace with savings in power consumed and increases in labour productivity. However, we again expect savings in power consumption to be offset by higher prices, and productivity gains have been included in labour savings.

H-V also plans to produce its own electric motors for use in its own pumps. It estimates that it will save \$200 per motor on its purchases of 6,000 motors in 1991. However H-V has considerable stocks of motors, and given its falling production of its existing product range, we have preferred not to include those savings in our estimates in Chapter 15.

Finally, we have indicated in 4.3 that cutting all inventories by half could save \$650,000 in interest charges.

11.2 DOMESTIC MARKET POTENTIAL

11.2.1 Customers

The product sales by industry are as follows.

INDUSTRY SECTOR	NO. OF MAJOR CUSTOMERS	TYPES OF PRODUCTS SUPPLIED
Domestic Water Supply	27	G SK PW
Chemical Industry	29	SK KS PW
Coal Mining	18	G SK KS PW
Shipyards	15	SK
Food Industry	21	KS SK G
Building	16	hydrophones, SK G
Energy	11	DW SK G KS

11.2.2 Market Segmentation

Market segmentation was based on standards of the major customers, which are listed below:

1. Water Infrastructure and Effluent Treatment (G, SK, P'W pumps)
2. Commercial and residential building (hydrophones, tanks, SK, G, CL pumps)
3. Chemical industry (SK, KS, PW pumps).
4. Mining (G, SK, KS, PW pumps).

5. Shipbuilding industry (SK pumps).
6. Food processing (KS, SK, and G pumps).
7. Energy production (PW, SK, G and KS pumps).
8. Metallurgy (SK, PW and DW).

Using the above list of market segments, the following evaluates the market potential of the specified user groups where suitable information was available. Estimates were made of the state of a given sector in the short term as well as information about production changes in January of 1992, relative to January 1991.

Information about sector conditions was obtained from the Polish Institute for Economic Development, at the Main School of Trade in Warsaw and information about the level of production was obtained from the Polish Central Statistic Office. In the case of commercial building, figures and estimates came from the Institute of Housing Economics relative to the building situation in 1992. These data sources indicate that in general, a worsening situation is predicted for manufacturing industries in the first half of 1992 though some improvement is expected in the latter half of 1992.

11.2.3 Water Infrastructure and Effluent Treatment

The water sector is a large potential market. Indeed, currently the water delivery infrastructure in Polish cities is in a very poor state. In large cities only about 20% of water supplies come from deep wells, and the remainder is drawn from river supplies that are not fit for direct consumption even after intensive treatment. It is generally recognised that an improvement in water quality would require a huge investment outlay. However, currently local Polish administrations do not have sufficient resources. In the short term therefore, the market potential of the water infrastructural sector is limited, although in the medium and longer term it must be very substantial (see Appendix 5).

Appendix 5 to this report clearly shows that a major future market for new products in the Polish water industry is in the area of effluent treatment. This will include not only pumps but also water treatment plants which H-V do not currently produce. It should be a major aim of the company's strategy therefore, to develop new products in this area.

11.2.4 Commercial and Residential Building

General falls in industrial production accompanied a decline in building of 24% for the year up to January. Thus 1991 was another year of decline in the building sector in Poland, which saw:

- decline in building demand, as investment starts dropped 14%, (36% for apartments), and permission for residential building starts fell by 20%;
- a reduction in actual investment outlays in the whole economy of about 11%; and
- a decrease in production of building supplies of about 3.5%.

On the other hand, the potential demand for apartments is very large. H-V produces pumps for the residential buildings market, which could expand by 3-5 times, if home builders became more affluent or there was a decrease in investment credit costs. In villages only four out of five users have pump supplied water. The remaining get water from a well, but clean water levels in Poland are declining which will rapidly force more deepwell pump usage.

11.2.5 Chemical Industry

The state of this sector is more buoyant than other industries and in January 1992 it was the only manufacturing sector to show an increase in output, which amounted to 2.2%. The chemical industry, therefore, probably offers better prospects in the short run than most of the sectors under consideration.

11.2.6 Mining Industry

In January 1992, compared to January 1991, the mining industries exhibited a production increase of 4%, which indicates encouraging short run sales potential.

11.2.7 Shipbuilding Industry

The shipbuilding industry in Poland is undergoing a severe recession due to the breakup of the former Soviet Union and the worsening condition of Polish shipowners. As a result, decidedly fewer ships are currently being built. For example in 1990 only 6 long distance cargo hauling ships were being built, while in 1989 15 were constructed.

Overall however, order increases at Polish shipyards are dependent largely upon world wide demand and their competitiveness on the international market. Demand for shipping is currently in decline world wide, and this does not augur well for short term sales prospects.

11.2.8 Food Processing Industry

Better conditions are forecast for this sector than for industry as a whole. Production falls in the processing sector were minimal and amount to 3.9% last year. Short term sales prospects may therefore be better than in many other sectors.

11.2.9 Heating and Energy Suppliers

The production of electrical energy in the 3rd quarter of 1991 was about 10% lower than the same period a year before. However, in 1990 output fell by 6.2% compared to 1989. These production declines are due to lower investment outlays. Similar falls occurred in the production of hot water and heating.

11.2.10 Metals Production

The production indicators are worse than average for industry. January 1992 showed the largest decline relative to all other manufacturing sectors, some 33%. Sales prospects for pumps are poor in the short term.

11.2.11 Industry Segmentation Conclusions

Sales efforts should be concentrated on those products which provide the highest margins (analysed in Chapter 7) and market segments which are growing, or not declining as fast as the others. The major conclusion to be drawn is to concentrate in the short term on vacuum pumps and blowers for the food industry while developing a dirty water capability. The chemical and mining sectors also offer better short term prospects than do other sectors.

Looking further ahead, the process of restructuring of the Polish economy makes it difficult to identify which sectors are likely to offer the best markets. However, we are very positive about the water and effluent sector, and we also expect food processing and mining to continue to be relatively buoyant sectors.

11.3 DISPOSAL OF ASSETS

11.3.1 Assets Currently Not in Use

Details of assets not in use as at 30 November 1991 are shown in Table 11.1. This data has been abstracted from the computerised fixed asset register and can be summarised as follows.

Table 11.1

ASSETS NOT IN USE, NOVEMBER 1991

	Average Age Years	Average Useful Life Years	At cost or valuation		Written down value	
			ZL million	\$ thousands	ZL million	\$ thousands
Buildings and Structures	20	25	9,125	791	6,352	551
Plant and Machinery	<u>9</u>	<u>6</u>	<u>4,862</u>	<u>422</u>	<u>2,361</u>	<u>205</u>
ALL ASSETS	13	11	13,987	1,213	8,713	756

Thus 8% of total fixed assets are not in use.

Whether any of these assets have a value other than as scrap is doubtful. Because of the spate of bankruptcies in Polish industry within the last two years the market for industrial buildings and plant is almost nonexistent. The general manager has been trying to give away some recreational facilities to the local authority, but they are reluctant to take them on as they would be liable for property taxes on them. Property taxes are payable on land and buildings whether or not they are in productive use.

11.3.2 Assets to be Released by Restructuring

H-V intends to concentrate production on one site, at Mniszek. This would leave vacant land and buildings in Grudziadz and Wabrzezno which in principle could be disposed of, realising funds to strengthen the balance sheet or to contribute to future investment. However, there are two obstacles to this apparently promising prospect.

First, in order to sell land and buildings, H-V would have to purchase them from the Treasury at a price which is unrelated to their market value, and is substantially higher than current market values. Although the Treasury is handing over the title to land and buildings of enterprises to be privatised, such enterprises will apparently not be free merely to sell of their assets without constraints. Secondly, the market for land and buildings, especially in Grudziadz is currently very weak as a result of the recession. There have been many factory closures there, with many assets now available for sale.

As a result of these obstacles, disposal of assets does not appear to be a promising short term option. Indeed H-V will be faced with the costs of maintaining empty properties and paying property taxes on them once the rationalisation of production has been completed.

However, in the longer term the sites in the centre of Grudziadz could have substantial value in different uses, for example for hotels or shopping centres. H-V is aware of this potential, but would need finance and specialised management skills (probably in joint ventures with hotel and retail companies) to develop them. Currently it is difficult to put a value on the sites were the need to be so used. H-V is currently registering its land as freehold (or long leasehold) and we understand that planning permission for change of use is not likely to be a problem.

H-V has also considered closing its foundry and buying castings from elsewhere. (India was mentioned as a possible source.) We do not recommend this measure, as

1. H-V could not control quality to international standards;
2. the lead times for ordering would increase considerably; and
3. H-V knows foundry technology well and should not surrender it without good reason.

However, if a low cost reliable supplier of castings could be found, closure of the foundry would become an option for consideration.

PART IV

STRATEGY FOR ENTERPRISE RESTRUCTURING AND DEVELOPMENT

12. STRENGTHS, WEAKNESSES, OPPORTUNITIES, THREATS (SWOT) ANALYSIS

In this analysis of the strengths, weaknesses, opportunities and threats facing H-V, this chapter draws on the preceding chapters of the report.

12.1 STRENGTHS

The market perceives H-V's products as being of high quality and the sales and promotional documentation is of an equal standing.

Prices are generally very competitive.

Although not fully complete, H-V's distributor and stockist network covers the whole of the country and is superior to the networks of all competitors.

H-V possesses good managers and a good quality work force.

H-V's product range, particularly applying to the submersible pumps, is extensive.

H-V has maintained a positive trading profit, and paid taxes and interest on time.

12.2 WEAKNESSES

The inability to collect information from the market place on a formalised regular basis has meant that H-V are unaware of market developments.

There has been a failure to keep pace with changing technology, and H-V have not updated its products to meet foreign standards nor developed other products for effluent treatment.

Apart from its relationships with POLIMEX and VARIMEX in supplying the Russian market, H-V has no direct export experience. The entry into new overseas markets therefore presents great difficulties for the company.

Due to the characteristics of the market in the old socialist economy, no direct sales people were required in H-V. Such people are now desperately required as the market has become fiercely competitive.

H-V suffers from serious financial illiquidity. There are excessive stocks, especially of finished goods and work in progress.

The product costing system, management accounting and management information systems are inadequate. Operating at three centres has caused unduly high operating costs. (The management has plans to centralise production at one site, though.)

H-V suffers from serious over-manning, and the management is correct to aim to reduce the number employed from around 1,050 to 650.

The incidence of high tax and interest payments are a substantial burden, and have reduced the trading profit to losses after tax.

The traditional, hierarchical management structure is unsuitable for a modern, privatised company.

12.3 OPPORTUNITIES

12.3.1 New Market Entrants

Western companies are entering the Polish market and undertaking the rehabilitation and construction of new water treatment plants. H-V should make itself aware of those companies and develop working relationships to capitalise on this emerging market.

12.3.2 Effluent Treatment

The opportunity exists to sell other pumps and related products either of its own manufacture or sourced elsewhere through the distribution network.

12.3.3 Castings and Forgings

Western European developed markets need suppliers of good quality castings and forgings. This opportunity should be investigated.

12.3.4 Vacuum Pumps and Blowers

The high margin high quality vacuum pumps and blowers (i.e. greater than 100%), should see a market in the French food industry. Local competition is evident through the Dresser company which markets the Rootes blowers, and the market potential should be investigated.

12.3.5 Aid Financed Markets in the CIS and the Third World

The CIS is familiar with H-V's products and wants to continue buying them. The prospects of aid from the West may enable them to do so. Failing that, barter arrangements (as with Byelarus) may renew these markets. Further potential markets exist in Latin America, Africa and the Middle East.

12.3.6 Privatisation and Tax Reduction

Privatisation will provide management and staff with greater incentives to operate successfully. At the same time the dividend tax payable on the state's shareholding will become a conventional dividend, based only on profitability and dividend policy. This will reduce the burden of taxation significantly.

12.3.7 A Joint Venture

A joint venture arrangement with a western partner offers opportunities in:

- financing;
- management (structures, skills and culture);
- marketing; and
- technology.

Such a joint venture can take many forms, and may not necessarily include equity. We elaborate on this in subsequent chapters.

12.4 THREATS

12.4.1 Increased Competition

In addition to the strong challenge from local competitors, H-V faces the threat of joint ventures being formed by those competitors with Western partners. If French and other water companies undertake work in Poland, there is the possibility that equipment supplies, including pumps will be sourced from their own subsidiaries.

12.4.2 Joint Ventures

Should H-V not develop a joint venture with a Western partner, then its long term viability would be very much in question.

12.4.3 Other Markets

If other overseas markets cannot be found then the high level of finished stock represents a serious threat to the financial health of the company.

12.4.4 Management

Failure to adopt a suitable management culture (such as Total Quality Management), perhaps through cooperation with a joint venture partner, may significantly impede the performance of H-V. The management need to become market oriented rather than product oriented.

12.4.5 Insolvency

There is a danger that the currently illiquidity may deteriorate into insolvency. Among the potential causes are failure to sell existing stocks, continued weakness of traditional markets combined with a failure to develop new markets, and the cost of moving to one site.

13. STRATEGIC PLAN FOR RESTRUCTURING IN THE SHORT TO MEDIUM TERM

13.1 STRATEGIC APPROACH

H-V requires a fundamental shift in management philosophy, from being a production oriented firm to becoming a market oriented firm. It also needs to diversify its markets, to develop new products and to strengthen its balance sheet while finding the resources to invest a further US\$6.66 million identified in Table 6.3. In order to achieve these objectives, H-V needs to develop a joint venture arrangement with a foreign partner.

That, we believe, is a necessary but not a sufficient condition for success. H-V must also reform itself from within, particularly in shifting from a production oriented to a market oriented company, and it is these reforms which we address first.

13.2 SALES AND MARKETING ORGANISATION

13.2.1 Overall

The following figure illustrates our proposals for reorganisation of the marketing department, which has been accepted by H-V's management. Apart from the changes in the export department discussed in 13.3, promotion and market research should be separate positions reporting direct to the Marketing Manager, clearly reflecting their importance. Market research needs to be conducted on a formal, structured and regular basis, which it is not at present.

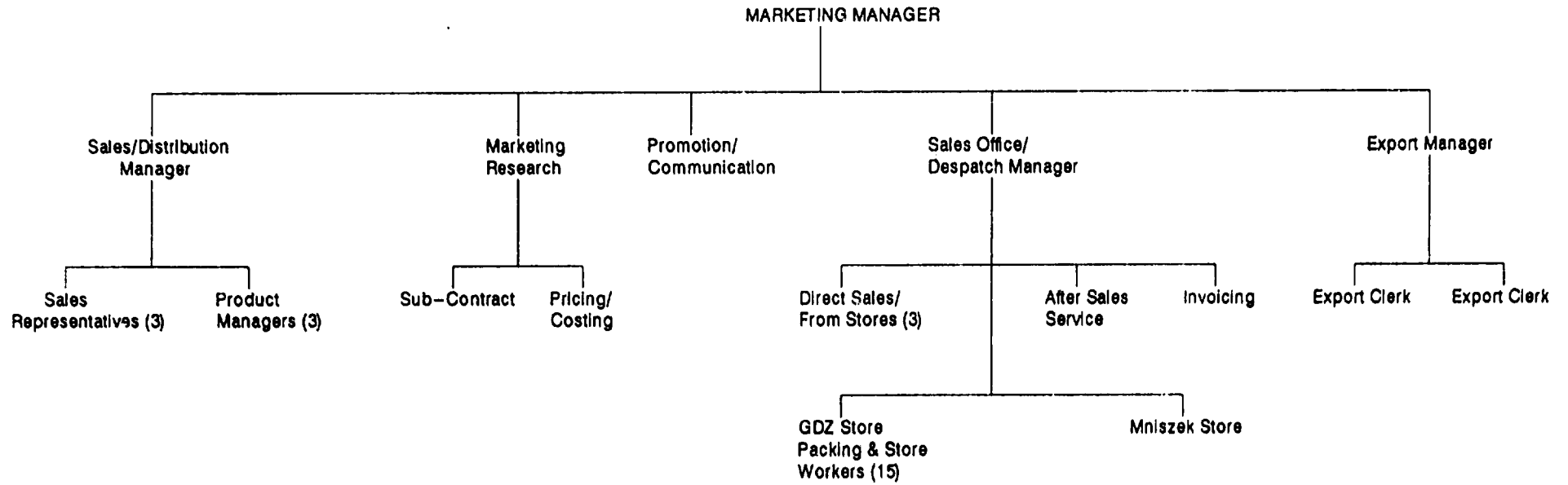
13.2.2 Sales

The number of product managers can be reduced to 3 with their current work load, while the remaining two should be redeployed in external sales positions. By giving them the responsibility for geographical areas, North and South, they could provide the necessary support to distributors and make sales visits to customers. This would relieve the current sales/distribution Manager to visit major accounts.

Should the work load of the product managers increase, due to increased enquiries, quotations and sales, then additional clerical support should be provided.

Figure 13.1

MARKETING DEPARTMENT: PROPOSED ORGANISATION



13.2.3 Marketing

Under the new structure the marketing staff will concentrate on:

Strategic Planning;
Marketing Research; and
Marketing Promotion/Communications.

The strategic planning and marketing research roles are closely related, and they also have a vital interface with new product development. It is suggested that the Marketing Manager should concentrate on strategic issues, supported by appropriate research. This role requires high level analytical skills, the ability to think strategically and with objectivity, supported by a close, continuously updated knowledge of the market place.

13.2.4 Information

Priority should be given to improving the department's information base. The most urgent priority is the creation of the customer data base and marketing control system. A sales force reporting system needs also introducing and such a system needs linking to the marketing control system and sales ledger to produce a system which tracks projects and customers from an initial enquiry to completion of order. It is important to note that all customers (not just the largest ones) should be carefully segmented and that, to ensure commercial control, the system should be extended to invoiced sales and orders received.

13.2.5 Market Orientation

Developing an appropriate organisational structure and a comprehensive customer data base are prerequisites for becoming truly market led but will not in themselves move the company in that direction. Being "a market led company", is a function of management - primarily top management. It is about how strategic decisions are taken and actioned. If H-V is to be genuinely market orientated three critical areas must be addressed:

Marketing management;
New product development; and
Customer orientation.

13.2.5.1 Marketing Management

There are two key aspects of marketing management that the company must get right:

- (i) Strategic management
- (ii) Operational management

It is suggested that the Marketing Manager should take responsibility for the former while delegating more operational issues to the relevant managers for sales/distribution, promotion, market research and export. The immediate objective, therefore, is to create the management systems which will enable the marketing manager to control all aspects of his company's response to the market place whilst delegating responsibility for decision making and actions as far down the hierarchy as possible. The following management systems are therefore suggested.

(i) Strategic Management

It is suggested that marketing strategy (the core of being a market led company) should be determined by a marketing strategy team. The makeup of this team should reflect the need to involve other functions within the organisation and it is suggested that membership should consist of the following:

- Marketing Director
- Marketing Manager
- Finance Director
- Engineering Manager

Of course the major share of the work delegated by the team would fall to the Marketing Manager but all other team members should be given individual responsibility for some tasks, in which they, in turn, may involve others.

(ii) Operational Management

Controlling the implementation of the marketing plan is a line management function. Line management functions do not need committees to make decisions - such decisions will have been made at the planning level. They do need effective management meetings which ensure that:

- information is available which enables appropriate managers to remain in full control of their area of responsibility, taking decisions for remedial action where necessary; and
- managers do not waste time between management meetings concerning themselves with matters which can be and should be delegated to subordinates.

To this end the Marketing Manager should create a system for his subordinates which provides him with control indicators as specified in Section 2. He should have brief but formal weekly meetings with each manager concerned and formal monthly meetings attended by all managers each of whom should produce a brief report covering the key indicators in his/her area of responsibility.

On this basis middle managers would assume day to day responsibility for all decisions and actions, involving the Marketing Manager outside scheduled meetings, only in exceptional circumstances. The same principles should apply to the working relationship between the Marketing Manager and Marketing Director. The former should involve the latter only in exceptional circumstances outside scheduled meetings. These should be monthly following the management meeting with an interim fortnightly review.

13.2.5.2 New Product Development (NPD)

If H-V is to be market led, new product development must be guided by the market place, and, consequently, by the marketing strategy team.

There are four urgent priorities that the marketing strategy team should attend to.

(i) **NPD objectives**

It is vital to spell out short term NPD priorities with their associated costs and time scales, followed by the development of a medium term (three year) new product development plan.

(ii) **NPD Authority**

Equally important and urgent is the need to clarify H-V's position as far as NPD is concerned. At the moment there is no formalised structure nor authority placed within the organisation which enables new products to be developed.

(iii) Continuous NPD action

Once a new product development plan has been finalised, the marketing strategy team has to devise a continuous process which will ensure that H-V remains market led. There are two key elements to this system.

Firstly there is a need for continuous information gathering to ensure that H-V is always aware of changing needs and priorities in the market place. Measures to achieve this will include: feedback from the newly strengthened sales force and other staff involved in dealing with customers; the formation of a formal panel to track customers' priorities and their perceptions of H-V's performance and the carrying out of specific research projects to aid particular NPD decisions.

Secondly there is a need for swift decision making and effective operational management to ensure that H-V is always responsive to changing needs and priorities in the market place. It is particularly important that this commitment to NPD is strongly endorsed by top management.

(iv) Pricing

Although not strictly within the realm of NPD it has been established that the method of calculating prices, although supposedly market led, may not be an accurate reflection of realities in the market place. Indeed, as is evident from the price comparison exercise discussed in Chapter 10, H-V's product pricing diverges very significantly from the pricing of these competing on the domestic market. For example H-V's range of liquid ring vacuum pumps are priced up to 50% below competitors prices, whilst H-V's impeller pumps are priced approximately 15% in excess of competitor prices. These differentials suggest a poorly performing pricing strategy and hence as far as pricing is concerned there are two main action recommendations.

Firstly, an important element of all future NPD decisions should be a pricing analysis to establish a competitive price level for a given set of product/service benefits for any particular product item or product range. It is this analysis which should determine a) H-V's go/no go investment decision and, b) its pricing policy if the investment decision is positive. H-V's internal costs will influence a) but not b).

Secondly a retrospective cost/benefit pricing analysis should be carried out for some existing lines whose pricing is suspected to be uncompetitive.

13.2.5.3 Customer Orientation

In the long run, a company cannot be market led without being customer orientated. This is particularly the concern of management but primarily a matter of culture. To make H-V more customer orientated the following action is recommended.

(i) Customer Service Team

It is suggested a customer service team be formed to drive the customer orientation programme forward and monitor its success. The team should be small, meeting once per month and its composition might be:

- Managing Director;
- Marketing Manager; and
- Sales/Distribution Manager.

(ii) Relationship Management Programme

A programme should be developed and implemented with the Marketing Manager taking responsibility for this function so as not to conflict with normal marketing and sales force activities.

(iii) Training

As well as commitment from the top, changing the culture of an organisation must involve a certain amount of training. It is suggested that H-V consider two specific training initiatives as part of its marketing action plan.

Marketing awareness training

If H-V is to become a marketing orientated company, all directors, all members of the marketing strategy team and all middle management in the marketing department must be totally familiar with basic marketing principles. Moreover, since marketing (in common with most management disciplines) is not a precise science, they should all have the same view of what marketing is and what that means for H-V.

It is therefore suggested that all appropriate managers attend an in-house course on strategic marketing, tailored to the needs of H-V.

Customer awareness training

All staff need training in the importance of customers. The main objective of such training would be to modify attitudes towards customers and to make staff think about the priorities which guide their actions from day to day. Training should be customer service focused, but would follow "total quality" principles with the objective of creating a work place environment where the staff themselves provide the main momentum for maintaining high standards of customer service.

This type of "total quality" culture training is often best carried out in-house by companies using the "cascade" approach. Such a programme could be coordinated in-house by the Marketing Manager with the assistance of volunteer team leaders. On this basis outside assistance would be limited to an initial presentation to senior management, advice to the Marketing Manager on the development of an appropriate in-house course and a "training of trainers" team leadership course.

Starting in the marketing department, such a programme would gradually move through the company, changing its focus as it goes from emphasis on the external to the internal customer. It is anticipated that in order to work through the company a time scale of at least two years would be necessary.

The initial action required for both training needs is collaboration between the Managing Director, Marketing Director and Marketing Manager to clarify objectives, priorities, budget and short term action plan.

13.3 EXPORT SALES

H-V has made limited exports in the past, mainly to the FSU and east European countries. A list of overseas markets supplied is included in Appendix 8.

13.3.1 Staff

Within the short term (i.e. up to 3 months), the existing staff of two should be adequate for the current and projected work during this period. Beyond this period, serious consideration should be given to employing a full time export manager to undertake overseas visits, supported by the internal staff.

13.3.2 Market Screening

World markets should be screened in order to determine which countries would be suitable to accept the pumps finished for the Russian market but not sold. Suggested screening criteria could be:

- geographical proximity;
- political affinity;
- predominance of water supplied by bore hole e.g. Middle East and North Africa;
- credit worthiness; and
- willingness to accept pumps not manufactured to Western standards.

Once completed, agents, distributors and end users should be identified and visited and the excess stock sold.

We have supplied H-V with contacts with three agents interested in marketing Pomorska pumps in these regions. They are:

- a) Middle East: Al Mutlaq Establishment for Trading and contracts, Dammam;
- b) Latin America: Euro-Latin Export Services, London; and
- c) Africa: Horsfall Associates, London.

A fourth agent, Europump, is being displaced or the UK distributor of Sarlin, and is interested in distributing H-V's pumps.

Once products are manufactured to Western standards, other more competitive markets could be entered.

13.3.3 Western Standards

Copies of all standards relevant to H-V's pumps should be obtained and evaluated against Polish standards. A programme then needs introducing to modify the company's pumps to conform to such standards.

13.3.4 Training

The development of and the maintenance of an effective export business requires skill, training and resources not yet available within the company. Access to any Government support is also limited. It is therefore suggested that training on all aspects of export be provided, as well as the training outlined above.

13.3.5 Joint Distribution

Once a joint venture agreement is concluded, the possibility of distributing H-V's products through joint venture partner's distribution networks should be explored.

13.3.6 Competitors

The exercise being conducted on the collection of competitors' literature and prices and the technical and commercial comparison of H-V's products and that of the competitors, should continue. Care must be taken to select only those competitors active in the overseas markets targeted from the market screening exercise and, furthermore, to ensure that the prices compared are those which can be obtained in those markets (i.e. compare H-V's export prices with the export prices of competitors, both delivered to the target market).

13.4 FINANCE AND ADMINISTRATION

In Chapter 10 we highlighted the need to upgrade the Economics and Finance Assistant CEO to a Finance Director who should be trained in western accountancy. We also emphasised the need to design and implement a new computer based Management Accounting/Management Information System.

13.5 A JOINT VENTURE ARRANGEMENT

Ideally H-V needs a joint venture arrangement which will provide:

- technology;
- finance;
- export marketing; and
- management skills.

Such joint ventures are not always readily available on acceptable terms. In particular it may be difficult to attract equity capital in the joint venture arrangement. Should that be the case, H-V should turn to the IFC or the EBRD for equity, and the EIB and World Bank for loans. (World Bank loan capital is handled by commercial banks in Poland.)

So far the firms H-V has had joint venture discussions with have not been entirely suitable. SIHI is a direct competitor, and EBARA's main interest, we understand, is in gaining access to H-V's casting facilities, and cooperation on production seems to be the likely result. Hanworthy of the UK is not suitable as it produces mainly shipboard pumps. There are still possibilities of a joint venture with SIHI in perhaps two years, and H-V has also recently started talks with an American company, but this firm is interested in a joint venture with only a part of H-V.

Given the potential for the use of pumps in water and effluent treatment in Poland, a joint venture with a firm which can provide turn-key (or project management) know-how would be highly desirable. Perhaps the best such firm is the UK's North West Water, which has a pump design and project management capability, but is not a manufacturer, and therefore not a competitor. North West Water is interested in the Polish market, and interested in a joint venture arrangement which could include an equity participation.

Other possibilities may be Biwater of the UK, or French water companies. However we have not approached any of these companies.

At this stage it is not possible to give specific advice on the appropriate terms of a joint venture agreement beyond that incorporated in the standard texts. UNIDO produced one of these which might still be available.⁽¹⁾ We do recommend though that a joint H-V/UNIDO/Maxwell Stamp working group be established to pursue joint venture possibilities and to review and negotiate offers received.

1. UNIDO (1979) Guidelines for the Evaluation of Transfer of Technology Agreements, United Nations, New York.

14. ACTION PLAN - DIRECTIONS FOR RESTRUCTURING

The following directions for restructuring are divided into 4 phases, covering a wide range of the activities of the company. They overlap in time to some degree but take into account the time probably needed to implement the improvements. The phases are generally in order of priority.

14.1 PHASE I: 0-3 MONTHS

14.1.1 Overall

These recommendations were included in the Interim Report, and are included in Chapter 3. They are repeated here for ease of reference.

1. Stop production of any components and products of which there is stock in the stores.
2. For other items, produce only to meet orders and this includes components for finished products.
3. Be prepared to extend the delivery time against customers orders beyond the present 2 to 4 weeks.
4. Increase sales promotion activities aimed at selling stock, notably to the Middle East, Latin America and Africa.
5. Take steps to update and validate all computer product costings.
6. Stop all manual clerical costing activities, unless replaced by computer. Actual costs are still collected manually.
7. Start reducing staffing in factories and offices as appropriate to the changed circumstances, and as social and political circumstances, and negotiations with the unions permit.
8. Introduce procedures to produce a set of financial accounts each month, including:
 - balance sheet;
 - profit/loss statement;
 - cash flow statement;
 - key ratios.

14.1.2 Marketing

1. Screen world markets for finished pumps.
2. Identify and visit agents, distributors and end users and sell pumps.
3. Obtain and evaluate relevant Western standards.
4. Reorganise marketing department as suggested.
5. Reduce product managers to 3.
6. Redeploy others into external sales positions.

14.2 PHASE 2: 0-6 MONTHS

14.2.1 Overall

1. Recruit and train a qualified Cost Accountant (CA). As cost accountants do not exist in Poland, the implementation will need a Polish/German speaking accountant to train a Polish recruit. There may be UK aid funds for training Polish accountants, available through the British Council.
2. Design and implement (with the assistance of the CA) a new costing system. Train the CA to understand the system and interpret the results for management.
3. Speed up the programme of implementation of new computer systems, particularly in respect of:
 - CAD/CAM - to reduce design and development labour;
 - Materials control - to reduce clerical labour time in stores, planning and accounting offices;
 - Plant maintenance work - to improve control of work and reduce staffing.
4. Reduce total staffing in the factories and offices to 650-700.
5. Introduce budgets of overhead expenses and budgetary control procedures for all production and services departments.
6. Prepare detailed plans for a possible move of all operations to Mniszek and show the financial result of this.
7. Review all data contained in the monthly bulletin:
 - replace financial statistics with the new set of financial accounts;
 - correct inaccuracies in overhead expense figures, for example, where direct labour is included in expenses; and
 - show direct and indirect expenses separately.
8. Clarify the future liquidity prospects of the company.
 - Consider the need for finance for the following capital investment of \$7.38 million.
 - Enter into negotiations with prospective partners and assess the financial prospects.
 - Assess the probability of equity and loans at advantageous interest and repayment rates becoming available from the IFC, the EBRD, the EIB and the World Bank.
 - Prepare a capital expenditure budget for 1993.

14.2.2 Marketing

1. Consider employing a full time export manager.
2. Introduce programmes to modify the company's pumps to conform to Western standards.
3. Instigate training programmes on all aspects of exporting.
4. Explore the possibility of distributing H-V's products through potential joint venture partners' distribution networks.
5. Continue exercise being conducted on the collection of competitors' literature and prices and the technical and commercial comparison of H-V's products.
6. Ensure Marketing Manager concentrates on strategic issues.
7. Give priority to improving the marketing department's information base.
8. Create customer data base and marketing control system.
9. Introduce sales force reporting system.
10. Create marketing strategy team.
11. Marketing strategy team to set new product development objectives and plan.
12. Create a system which provides control indicators for the Marketing Manager as specified in Chapter 7.
13. Instigate a programme of formal weekly and monthly meetings.

14.3 PHASE 3: 3-12 MONTHS

14.3.1 Overall

1. Provide training courses for all senior executives and for all marketing and selling staff in the English and/or German languages.
2. Prepare a programme of sales promotion of the company's products in Western Europe, the USA and the Far East with specific pump users and competitors identified.
3. Pursue the potential business in the new Russian states/republics to follow-up the obvious demand for H-V products and spares to the point when they are able to pay for supplies. In the meantime find agents to operate on a barter basis in Russia, the Ukraine and perhaps other states, similar to the arrangement in Byelarus.

14.3.2 Marketing

1. Introduce all H-V pump products to identified target markets to gain direct export experience.
2. Enter more competitive markets.
3. Form a customer service team.
4. Develop and implement a relationship management programme.
5. Introduce training programmes on marketing and customer awareness.

14.4 PHASE 4: 12-18 MONTHS

1. When the required finance is available, implement the move to Mniszek, and other investment.
2. Continue to consolidate the new organisation and systems and achieve the associated reductions in costs.

15. LONG TERM VIABILITY OF THE RESTRUCTURED ENTERPRISE

15.1 DISCOUNTED CASH FLOW (DCF) ESTIMATES

The latest estimated investment cost required to convert H-V into a modern, internationally competitive pumps manufacturer and turn key projects supplier is US\$6.66 million at early 1992 prices. This is lower than the earlier estimate of \$7.88 million.

Table 15.1 shows the profit and loss account for 1991, together with the forecast made by H-V for 1992 and a projection for the year 2,000. (This is not a forecast.) The assumptions on which the projection is based are included with table 15.1. We believe these assumptions are the best that can be made at present. Table 15.2 shows an estimated balance sheet for the end of 1992.

We assume that there will be no significant reduction in employment in 1992, but that over 1993 and 1994 numbers employed will fall by about 40%, and that wages, salaries and payroll tax will fall by 20% in real terms. We have built these assumptions into the DCF appraisal in Table 15.3.

We assume a small increase in sales in 1992, as stocks are reduced. After 5 months, sales were stable. Sales prospects for 1993 and beyond look promising. H-V is close to signing new contracts for some \$6 million over perhaps 4 years. Negotiations are in hand with Gupa Technik and Est Alu for sales of castings, with SIHI Halberg for sales of castings and pumps, and with Keglér (France) for sales of submersible pumps. In addition there are sales prospects in Egypt for vacuum and centrifugal pumps, and in Russia (submersible pumps) and Uzbekistan. H-V will meet the Minister of Water, Byelarus in July to discuss the supply of submersible pumps.

The profit for the year 2000 in constant US\$ is shown as \$1,229,000. The impact of the restructuring is therefore to convert H-V into a profitable company. However, the question is whether the returns justify the new investment which is needed.

The appraisal of new investment in restructuring and rehabilitation projects is notoriously difficult. The central problem is how to value the existing assets. At one extreme they are valued at zero; that is, without the new investment they would be worthless. The other extreme is to value them at book value, which is frequently an exaggeration. If that is done, it implies that the enterprise is a going concern without any new investment, or that restructuring is not really needed anyway. The true value usually lies somewhere between these extremes. With a true market for assets, it would be possible - although difficult - to value them. In the case of Poland the market for assets is highly imperfect, and

valuation is a major problem. We have, therefore, taken the economic value of the assets as 50% of 1992 book value in the appraisal that follows. We have also taken the benefits of the investment as the pre tax returns before interest (so as to avoid assumptions about the financing of the new investment) and before depreciation, to avoid double counting of assets. We have also assumed a gradual build-up of profits between 1993 and 2002, further assuming that the new investment will be made in 1993, and that it will have an economic life of 10 years. Although this is a somewhat stylised approach, more elaborate assumptions would not necessarily be more realistic, and would not affect the internal rate of return significantly.

The internal rate of return of 51% is highly satisfactory. The result is more sensitive to the value of existing assets than to any other variable, but even using the full book value of the assets, the IRR is 31%. Even with the higher investment cost of \$7.88 million the respective IRRs are 44% and 28%, which are more than adequate. Although uncertainty clearly exists around some other variables, the result is obviously sufficiently robust to engender confidence in the future of H-V, and to attract finance and a foreign partner.

The future of H-V improves even further where the after-tax profit is considered. However the improved tax position arises as a result of a change of status rather than from restructuring and new investment, so we have left tax gains out of the calculation.

One of the major remaining uncertainties is the source of finance for the new investment, and the source of improved technology. We have discussed possible sources in Chapter 13 but obviously work still remains to be done to acquire finance and a foreign partner.

15.2 A NOTE ON DCF

Discounted cash flow is a method of taking into account the returns to a project over a number of years. It takes into account the timing of the returns. Clearly \$100 earned this year is worth more than \$100 earned next year, to the extent that interest can be earned on the \$100 earned this year. If the interest rate is 10% then \$110 earned next year is worth \$100 earned this year. In other words we discount \$110 in next year by 10% to get its present value in this year. We can similarly discount all the net benefits (or cash flow) of an investment over the economic lifetime of the investment to get a figure for the net present value (NPV).

The size of the NPV depends on the discount rate (or the rate of interest) used to discount the cash flow. The higher the discount rate, the lower will be the NPV. For a given cash flow, there will be a discount rate at which the NPV = 0. That discount rate is known as the Internal Rate of Return (IRR). This is in effect a return on capital employed over the lifetime of the project, expressed in present value terms. If the IRR is greater than the real rate of interest, the investment is acceptable.

Undertaking DCF requires several conventions, notably:

- depreciation is excluded, as it would be double counting the investment;
- inflation is excluded; all estimates are in real terms;
- interest is excluded, as it depends on the financing of the project. The IRR therefore should be greater than the real rate of interest (currently about 7-10% in Poland);
- tax is excluded, as it is often difficult to estimate for a company. Therefore the IRR is a pre-tax rate of return.

We can vary the assumptions used in estimating the cash flow, and therefore get different measures of the IRR. This is known as sensitivity analysis. In the case of H-V the lowest of the four IRRs estimated was 28%. This is well above the real interest rates (7-10%) so the restructuring and new investment are clearly expected to produce a very good return.

Table 15.1

PROJECTED PROFIT AND LOSS STATEMENT

(1991 AND 1992 - current US\$ '000; 2000 - 1992 US\$ '000)

	1991	1992	2000
US\$ = ZLOTY	11,530		
Total Sales	16,682	16,935	22,291
Less: Turnover Taxes	1,062	755	1,025
=Net Turnover	15,620	16,179	21,266
Total Cost of sales	7,052	7,667	10,633
Gross Margin	8,569	8,513	10,633
" " %	54.86%	52.61%	50.00%
Expenses:			
Wages & Salaries and Payroll Taxes	3,298	3,298	2,638
Power	591	720	864
Repairs & Maintenance	452	500	600
Depreciation	807	720	720
Real Estate Taxes	223	220	220
Capitalised Maintenance	(364)		
Financial Gains & Losses	727	720	720
Other Expenses	105	120	120
Total Expenses	5,838	6,298	5,882
Operating Profit/(loss)	2,731	2,215	4,751
Interest	2,211	820	1,214
Pre-Tax Profit/(loss)	521	1,394	3,537
LESS: Proposed write offs:			
Debtors write-off		415	
Stock write-off		324	
Income Taxes	258	558	1,420
Dividend Taxes	715	450	488
PPWW Tax	608	608	400
Total Taxes	1,581	1,616	2,308
Profit (Loss) After Tax	(1,061)	(961)	1,229

Table 15.2

BALANCE SHEET 1991 - 1992

(CURRENT US\$ '000)

	DEC 91	DEC 92
US\$ = Zloty	11,530	
FIXED ASSETS		
Fixed Assets	9,096	8,476
Intangible Assets	3	3
Shares in Associate Co.	378	378
	-----	-----
Total Fixed Assets	9,477	8,857
CURRENT ASSETS		
Cash	142	100
Accounts Receivable		
Trade	2,307	2,400
Government	656	600
Reserve Bad Debts	(66)	(100)
Inventories	3,463	2,600
Prepayments	33	30
Other Debtors	30	30
	-----	-----
Total Current Assets	6,564	5,660
CURRENT LIABILITIES		
Accounts Payable:		
Trade	3,878	3,600
Government	774	600
Employees	109	100
Short Term Loans	347	1,311
Short Term Notes	1,020	304
Special Funds	144	150
Deposits	73	70
Other	8	10
	-----	-----
Total Current Liabilities	6,352	6,145
NET CURRENT ASSETS	212	(485)
TOTAL NET ASSETS	9,689	8,372
	=====	=====
REPRESENTED BY:		
Long Term Notes		
Shareholders' Funds:		
Treasury Capital	3,252	2,482
Company Capital	7,493	6,845
Retained Earnings:		
Prior	5	5
Current	(1,061)	(961)
	-----	-----
Total Shareholders' Funds	9,689	8,372
CAPITAL EMPLOYED	9,689	8,372

Table 15.3

DCF APPRAISAL OF THE RESTRUCTURED ENTERPRISE

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
New Investment	-6.66									
50% of Existing Fixed Assets	-4.74									
Operating Profit	2.70	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00
Add Depreciation	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Net Benefits	-7.98	3.72	3.97	4.22	4.47	4.72	4.97	5.22	5.47	5.72
		Investment \$6.66mn	Investment \$7.88mn							
IRR	51%		44%							
IRR with 100% of Existing Assets	31%		28%							

Assumptions to tables 15.1 and 15.2

1. Sales as per H-V/Maxwell Stamp forecast including \$4 million for new products in 2000.
2. Cost of sales per materials costing currently achieved. Assumes the same margins will be made on new products.
3. Expenses
 - a) Salary costs and taxes held at 1991 levels in 1992. Staff numbers then fall by about 40% over 1993 and 1994, reducing wages and salaries and payroll taxes by 20%.
 - b) Power - H-V forecast 1992. Increased in line with production for 2000.
 - c) Repairs and maintenance forecast for 1992, increased for volume for 2000.
 - d) Depreciation - H-V forecast 1992. Held constant each year.
 - e) Real estate taxes - constant.
 - f) Financial gains/losses - constant.
 - g) Other expenses - constant
4. Interest - 1992 level, plus interest on new borrowing of 50% of new investment at 10% interest on US\$. The 1992 figure allows for reductions in inventories (and their financing cost) and the reduction in short term notes in the balance sheet.
5. Write offs assumed in 1992: amounts as estimated in Chapter 4.
6. Taxes
 - Income tax @ 40%
 - Dividend taxes @ 13.75%
 - PPWW tax - estimated.
7. Capitalised Maintenance is the procedure of treating substantial maintenance expenditure (such as a major overhaul to prolong the life of an asset) as an investment, and then writing it off over a number of years. This is a procedure used by H-V in the management accounts, but in our estimates we have considered it more appropriate to write it off in the year the expenditure was made, as H-V usually do this at the time of the audit.

APPENDIX 1

HYDRO-VACUUM: ACCOUNTS 1989-1991

	DEC 89	DEC 90	DEC 91
PROFIT AND LOSS STATEMENT IN MILLIONS OF ZLOTIES			
Total Sales	27,496	154,010	192,347
Less: Turnover Taxes	2,222	18,480	12,244
=Net Turnover	25,274	135,530	180,103
Total Cost of sales	12,296	58,470	81,304
Gross Margin	12,978	77,060	98,799
" " %	51.35%	56.86%	54.86%
Expenses:			
Wages & Salaries	4,166	16,180	22,747
Payroll Taxes	2,708	9,630	15,275
Power	1,100	5,790	6,809
Repairs & Maint	1,414	4,590	5,214
Depreciation	344	4,080	9,303
Real Estate Taxes and Duty	70	2,910	2,567
Capitalised Maintenance			(4,196)
Financial Gains & Losses	(1,834)	4,770	8,382
Other Expenses		750	1,207
Total Expenses	7,968	48,700	67,308
Operating Profit/(loss)	5,010	28,360	31,491
Interest		11,620	25,488
Pre-Tax Profit/(loss)	5,010	16,740	6,003
Income Taxes	2,408	9,170	2,977
Dividend Taxes	694	5,180	8,248
PPWW Tax	840	990	7,007
Total Taxes	3,942	15,340	18,232
Profit After Tax	1,068	1,400	(12,229)

HYDRO-VACUUM CONVERTED TO US\$ 000s, 1989 - 1991

	DEC 89 2,000	DEC 90 10,000	DEC 91 11,530
US\$ = ZLOTY			
PROFIT AND LOSS STATEMENT			
(IN THOUSANDS OF DOLLARS)			
Total Sales	13,748	15,401	16,682
Less: Turnover Taxes	1,111	1,848	1,062
=Net Turnover	12,637	13,553	15,620
Total Cost of sales	6,148	5,847	7,052
Gross Margin	6,489	7,706	8,569
" " %	51.35%	56.86%	54.86%
Expenses:			
Wages & Salaries	2,083	1,618	1,973
Payroll Taxes	1,354	963	1,325
Power	550	579	591
Repairs & Maint	707	459	452
Depreciation	172	408	807
Real Estate Taxes	35	291	223
Capitalised Maintenance			(364)
Financial Gains & Losses	(917)	477	727
Other Expenses		75	105
Total Expenses	3,984	4,870	5,838
Operating Profit/(loss)	2,505	2,836	2,731
Interest		1,162	2,211
Pre-Tax Profit/(loss)	2,505	1,674	521
Income Taxes	1,204	917	258
Dividend Taxes	347	518	715
PPWW Tax	420	99	608
Total Taxes	1,971	1,534	1,581
Profit After Tax	534	140	(1,061)

MAXWELL STAMP^{PLC}

HYDRO-VACUUM CONVERTED TO US\$ 000s. 1989 - 1991

	DEC 89 2,000	DEC 90 10,000	DEC 91 11,530
US\$ = ZLOTY			
BALANCE SHEET			
FIXED ASSETS			
Fixed Assets	8,905	11,525	9,096
Intangible Assets	0	0	3
Construc in Progress	12	5	0
Shares in Assoc Co	27	47	378
Office Equip	6	8	0
Total Fixed Assets	8,950	11,585	9,477
CURRENT ASSETS			
Cash	415	74	142
Accounts Receivable	0	0	0
Trade	4,326	3,387	2,307
Govern	1	26	656
Reserve Bad Debts	0	0	(66)
Inventories	2,525	2,363	3,463
Prepayments	7	2	33
Other Debtors	48	3	30
Total Current Assets	7,322	5,855	6,564
CURRENT LIABILITIES			
Accounts Payable:			
Trade	2,361	3,340	3,878
Govern	1,608	416	774
Insurance	175	75	0
Employee	315	64	109
Short Term Loans	0	0	347
Short Term Notes	1,342	1,255	1,020
Special Funds	85	47	144
Deposits	17	72	73
Other	0	0	8
Total Current Liabilities	5,903	5,249	6,352
NET CURRENT ASSETS	1,419	606	212
TOTAL NET ASSETS	10,369	12,191	9,689
REPRESENTED BY:			
Long Term Notes	486	0	0
Stakeholders Funds:	0	0	0
Treasury Capital	0	0	0
Company Capital	3,599	3,792	3,252
Retained Earnings:	5,750	8,259	7,493
Prior	0	0	0
Current	0	0	5
	534	140	(1,061)
Total Stakeholders Funds	9,883	12,191	9,689
CAPITAL EMPLOYED	10,369	12,191	9,689

HYDRO-VACUUM CONVERTED TO US\$ 000s, 1989 - 1991

US\$ = ZLOTY	DEC 89	DEC 90	DEC 91
CASH-FLOW	2,000	10,000	11,530
Net Cash Inflow from Operating Activities -see note 1		3,823	3,868
Returns on investments and servicing of finance:			
Interest received			
Interest paid		(1,162)	(2,211)
Dividends paid		(518)	(715)
Net cash outflow from returns on investments and servicing of finance		<u>(1,680)</u>	<u>(2,926)</u>
Taxation:			
Profits Tax		(917)	(258)
Extra Salary (PPWW) Tax		(99)	(608)
Tax paid		<u>(1,016)</u>	<u>(866)</u>
Investing Activities:			
Aquisition of Intangible Fixed Assets		(20)	(335)
Aquisition of Tangible Fixed Assets		(36)	(25)
Construction in Progress & Other Assets		5	13
Renovations of Fixed Assets		33	(364)
Sales of Tangible Fixed Assets		0	(46)
Net cash outflow from investing activities		<u>(18)</u>	<u>(757)</u>
Revaluations of Fixed Assets		(3,025)	528
Revaluation Adjustment			1,530
Net cash inflow before financing		(1,916)	1,377
Financing:			
Increase in Loans			
Repayment of loans		(486)	0
Increase in Treasury Capital		193	(540)
Increase in Company Capital		2,509	(766)
Increase/Decrease in ret reserves		(534)	(135)
Net cash inflow from financing		<u>1,682</u>	<u>(1,441)</u>
Increase/(Decrease) in cash and cash equivalentents		(234)	(64)
		=====	=====

MAXWELL STAMP^{PLC}

HYDRO-VACUUM CONVERTED TO US\$ 000s, 1989 - 1991

US\$ = ZLOTY

DEC 89 DEC 90 DEC 91
2,000 10,000 11,530

NOTES TO THE CASH FLOW STATEMENT

1. Reconciliation of operating profit to net cash inflow from operating activities:

Operating Profit	2,836	2,731
Depreciation Charge	408	807
Loss on sale of tangible fixed assets		
Decrease/(Increase) in Stock	162	(1,100)
Decrease/(Increase) in Debtors	964	459
Increase/(Decrease) in Creditors	(547)	971
Net cash inflow from operating activities	3,823	3,868

2. Analysis of changes in cash and cash equivalents during the year:

Balance at 1 January	0	(1,161)
Net cash inflow/(outflow)	(1,161)	(64)
Balance at 31 December	(1,161)	(1,225)

3. Analysis of cash and cash equivalents shown in the Balance Sheet:

Cash at Bank and in hand	74	142
Short Term Investments		
Short Term Borrowings	0	(347)
Short Term Notes	(1,235)	(1,020)
	(1,161)	(1,225)

4. Analysis in changes in financing during the year

Company capital at 1 January	5,750	8,259
Increase	2,509	(766)
Company Capital at 31 December	8,259	7,493
Treasury capital at 1 January	3,599	3,792
Increase	193	(540)
Treasury Capital at 31 December	3,792	3,252
Retained Reserves at 1 January	534	140
Increase/(Decrease)	(534)	(135)
Retained Reserves at 31 December	0	5
Long Term Loan at 1 January	486	
Loan Repayments	(486)	
Loans at 31 December	0	0

HYDRO-VACUUM CONVERTED TO US\$ 000s, 1989 - 1991

US\$ = ZLOTY

DEC 89 DEC 90 DEC 91
2,000 10,000 11,530

RATIOS

Profitability Ratios:

§ Gross Profit/Turnover	51.35%	56.86%	54.86%
§ Pre-tax Profit/Turnover	19.82%	12.35%	3.33%
§ Return on Capital Employed (Pre-Tax Profit/Cap Emp)	24.16%	13.73%	5.37%
§ Return on Total Equity (Post-Tax Profit/Stakeholders Funds)	5.40%	1.15%	-10.95%
§ Return on Company Equity (Post-Tax Prof/Company Funds)	8.50%	1.67%	-16.47%

Balance Sheet Ratios:

§ Debt/Equity	4.69%	0.00%	0.00%
§ Debt/Equity (Taking Treasury Capital as debt)	39.40%	31.10%	33.56%
§ Liquidity (% of CE held as cash)	4.00%	0.61%	1.46%
Liquid Ratio (Cash & Debtors/Current Liabs)	0.80	0.66	0.49
Current Ratio (Current Assets/Current Liabs)	1.24	1.12	1.03

Other Ratios

Average Number Debtor Days	115	81	65
Average Stock Turnover Days	150	148	179

APPENDIX 2

COMPARISON OF HYDRO-VACUUM AND OTHER PUMPS

WEIR - UK

Borehole:

Type Ulectriglide

Range Diameter 10" (254 mm) - 14.1/4" (356 mm)

Flow 28 - 500 m3/h

Head 30 - 260 M

Weir cover most heads other than H-V's lowest and highest extremes and cover the upper half of the H-V flow range. Weir's other pumps go up to 1,300 MW power.

Comparison:	Weir	H-V	
Flow l/m		2,160	2,000
Head M	72	76	
Diameter mm	305	300	
Type	UBW 235 3 stage	GD4.02.1.2 2 stage	
Cast iron version			
Silicon bronze impeller			
Motor	ranklin 37 KW	SGMe27	

Price pump + motor £4,400 + VAT delivered UK List 1992r
incl 4M cable = \$7,570 \$3,473 118% marc

Centrifugal multistage:

Weir LM range, not described as self-priming, (but having an external balance water return pipe) looks otherwise similar to H-V SK Self-priming using a sidewise passage. Assumed not comparable.

KSB (Klein, Schanzlin & Becker AG) - Germany

Borehole:

Range

KSB Type	UPA 100	UPA 150	UPA 200	UPA 250
Hole Dia (ins)	4	6	8	10
Flow (m ³ /h)	0.8 - 11	6 - 64	20 - 320	47 - 300
Head (M)	13 - 160	10 - 330	10 - 330	18 - 600
Jacket	CrNi	CrNi	Cast iron	
Suction casing	CrNi	Cast iron	Cast iron	
Stage casing	Noryl	CrNi	Cast iron	
Impeller	Noryl	Noryl	Noryl	
Motor bearing body	CrNi	CrNi	Cast iron	
Motor stator casing	CrNi	CrNi	CrNi/steel	

These cover the H-V₃ flow range and exceed the H-V head range. Assuming the H-V's plastic impeller (most smaller sizes) is equivalent in performance to Noryl, only UPA 200 is comparable because of the greater use of stainless steel (CrNi) in the smaller diameter pumps and the incomparable head of UPA 250.

The following is the nearest comparison:

	KSB standard design	H-V
Type	UPA 200-11/12	GC3.17.2.2
Plus motor	UMA 150B 33/21	SG Me 24
Stages	12	17
Pump diameter	184	208
Hence hole diameter	200	250
Flow (m ³ /h)	36	35
Head (M)	250	258
Speed (rpm)	2880	2900
Case	Cast iron (some stainless)	Grey cast iron
Impeller	Noryl	Silicon bronze
Volts	380	380
Price £2,350 ex works with (min) 10M cable	\$4,042	\$4656

While not strictly comparable both pumps deliver the same hydraulic power (flow x head) yet KSB achieves this with a smaller hole (less drilling cost), fewer stages, some better materials and is cheaper.

Chemical: KSB's Type CPK is three times the head and 30 times the flow of the H-V KS, and is therefore not comparable.

Self-priming: KSB's ring section (self-priming) for clean liquids compares in their brief production programme description with the H-V SK. In addition KSB's products and quality of brochure presentation are impressive.

Liquid Ring Vacuum Pumps

The Table below shows the cost comparison for liquid ring vacuum pumps.

Table

	SPP	Bergeron Rateau	Graham Type	H-V
	RPA35 50Hz	Hydro PL20	Pepvac V7130	PW 7.13
	Close coupled		On base, coupling/guard	
Speed (rpm)	960	970	975	960
Flow (m ³ /h)	1,050-1,170	1,200	697-1,164	1,050-1,150
Press (Torr)	160-560	?	90-660	170-660
Motor KW	37	30	30	37
Dia (mm)	125	180	?	125
Price pump + motor, France	Ex works	Ex works	Ex works	
110,000 FFr	£6,220 \$10,700	£11,340 \$19,500	£7,456 \$12,825	\$8,037

It is evident from the table, in contrast to the GC3.17.2.2. impeller pump, H-V's selling price is in fact well below the overseas competitors' prices.

Semi Comparable Manufacturers

LOWARA Italy

Borehole. up to three times the flow for the same range of heads as H-V. Stainless steel hydraulic components so not comparable.

Close coupled centrifugal CN2CNF etc similar appearance to H-V KS but stainless steel impeller and wider performance range:

Type	Lowara		H-V	
	CN4-22CNF4 40-200	CN-2CNF 40-200	KS5.11 2:21.5	KS7.26 2121.5
Speed (rpm)	1450	2900	1450	2900
Flow (m3/h)	15	50	15	48
Head (M)	11	21	10.8	22.5
Motor KW	1.1	4	.95	4.7
Price	#414 \$712 of range	#458 \$788	\$789 min of range	\$2,744 max

Comparison may not be like for like because it is not possible to relate the H-V price list to the KS brochure precisely. Self-priming AR-1 pumps are much smaller than the H-V KS

Non-Comparable Manufacturers

Grosvenor UK

Turboflow: more head and much less flow than the H-V KS.

ALLIS Mineral Systems UK

Chemical: nine times the flow and head of the H-V KS.

Trash Hog II: self-priming but pumps solids unlike SK.

Self-priming 2" five times the flow (same head) as SK.

End suction, not Chemical like KS.

GILBERT GILKES UK

Self priming only single phase and less head more flow than SK.

DRESSER UK

Their only end suction single stage is for water, not chemicals.

Worthington Simpson for food and inks.

Referred to Holmes Dresser for blowers but theirs are virtually positive displacement interlocking fans.

INGERSOLL-RAND UK

Chemical pump made of glass reinforced plastic and has greater head and wider product range than H-V.

STORK - UK

Multi-stage self priming for water: has less flow and less head than H-V SK.

Self-priming centrifugal for chemicals: H-V KS are not self priming, and H-V SK are multistage.

Stork vacuum pumps are a combination also for self-priming pumping of liquids and have different ranges of pressure and head from H-V.

SIHI UK

Their only Chemical pumps are stainless steel or self-priming Hastaloy.

Their only vacuum pump is Ryvac LEH in the summary range brochure, but not detailed in the catalogues received. Flows up to 900 m³/h and pressures greater than 33 mbar.

SIHI do not manufacture borehole submersibles in UK or in Holland. However Hayward Tyler in the same group do.

PRODUCT RANGE COMPARISON H-V AND SIHI

The following is a comparison of the proportion of pump types covered by the catalogues of H-V and of SIHI (S). However H-V's catalogues do not do it justice in claiming all the uses which are possible.

Pumps for Liquids by Configuration Centrifugal = Radial Flow

Close coupled	H-V	S
End suction back pull off	H-V	S
Single stage,	H-V	S
double entry		
Vortex		
Regenerative		
Channel impeller		
Side channel		
Multi-stage, single entry	H-V	S
axial split		S
In line		
Self-priming	H-V	S

AXIAL FLOW

MIXED FLOW

ROTARY POSITIVE DISPLACEMENT

Flexible vane		
Internal gear		S
External gear		
Helical rotor		S
Peristaltic		
Sliding vane		
Lobe		
Orbital lobe		
Screw		
Archimidean screw		

RECIPROCATING DISPLACEMENT

Diaphragm, oil free		
single entry		
double entry		
Piston		
Plunger/ram		
Jet		
Proportion and dosing		

Pumps for Gases

LIQUID RING

Vacuum	H-V	S
Compressor	H-V	S
Magnetic drive	-	S ₋
Number	7	11

Pumps by Use or Substance Pumped

WATER SUPPLY

Raw,	H-V	
borehole submersible	H-V	
borehole shaft driven		
Potable	H-V	S
desalination		S
reverse osmosis		S

IRRIGATION

Intake	H-V	S
Spray		

DOMESTIC AND OTHER SMALL

Borehole submersible	H-V	
Shower		
Swimming pool		
Hotwater circulating,		
glandless		S
magnetic drive		S
canned motor		S
Car wash		S
Garden fountain		S
Air conditioning/refrigeration		S

SEWERAGE

Raw		S
submersible		S
Sludge		S
Treated		S
Effluent		S

PETROCHEMICAL

Oil, crude extraction		
mud		
pipeline		
Fuel, heavy		
light and solvents		S
Lubrication		
grease		
Cargo and cargo stripping		S
Tar and liquor		

FIRE

Stationery	H-V	S
Portable	H-V	S

MARINE

Bilge	H-V	
Sewage		
Boiler feed		S
Fire	H-V	
Docks, dry and floating		

CIVIL

Gravel/sand		
Dredging		
Slurry		
Mine tailings		
Concrete		
Drainage, land mine		
Dewatering	H-V	S
Storm water		
Flood control		
Contractor	H-V	

PROCESS

Chemicals,	H-V	S
abrasive		S
Paper stock		S
Liquid metals (hot)		
Liquid gases (cryogenic)		
Nuclear (radioactive)		
Ink		
Glue		
Ash		
Condensate extraction		S
Tannery fleshings		
Descaling		
Flue gas desulphurisation		
Blood		

FOOD AND DRINK

Food,		S
molasses		
sugar beet		
fish		
Drink,		S
Brewing stuff		
Beer dispensing		

OTHER

Hydraulic systems		
Oil burner/fuel injection		S
Laboratory		
Cooling water		S
Machine tool suds		
Barrel emptying		
Macerator	-	-

Total	12	29
-------	----	----

APPENDIX 3
PROFITABILITY IN % FOR H-V PRODUCTS IN 1991

Item	Description	Selling price £	Mnfg cost £	Gross profit £	Gross margin %
1	Pump S	84.89	194.26	-109.37	- 56.3
2	Pump SK2	67.84	53.48	14.36	26.9
3	Pump SK3 SK4	79.11	56.43	22.68	40.2
4	Pump SK5 SK6	174.60	144.80	29.80	20.6
5	Pump SK7 SK8	324.91	271.23	53.68	19.8
6	Hydrophone & SK4	154.90	187.52	-32.62	-17.4
7	Hydrophone & SM4	124.77	158.66	-33.89	-21.4
8	Pump CL	44.05	39.31	4.74	12.1
9	Pump COK	48.69	-17.70	66.39	375.1*
10	Pump KS	298.93	223.30	75.63	33.9
11	Vacuum pump blowers PW1 DW1	186.71	80.56	106.15	131.8
12	Vacuum pump/ blowers PW4 DW4	506.73	250.76	255.97	102.1
13	Vacuum pump/ blowers PW7 DW7	2348.78	1370.12	978.66	71.4
14	Pumps G60	436.00	314.50	121.50	38.6

15	Pump G80	387.52	342.10	45.43	13.3
16	Pump G100	455.07	379.78	75.29	19.9
17	Pump G125	634.67	464.87	169.80	36.5
18	Pump GA2 GA4	250.83	176.61	74.22	42.0
19	Pump GBO & GB1 GB2	256.89	181.15	75.74	41.8
20	Pump GC1	474.76	641.36	-166.60	-26.0
21	Pump GC2 GC3	695.08	394.16	300.92	76.3
22	Pump GC4	601.95	483.09	118.86	24.6
23	Pump GD2	829.94	596.57	233.37	39.1
24	Pump GD4	931.81	869.95	61.86	7.1

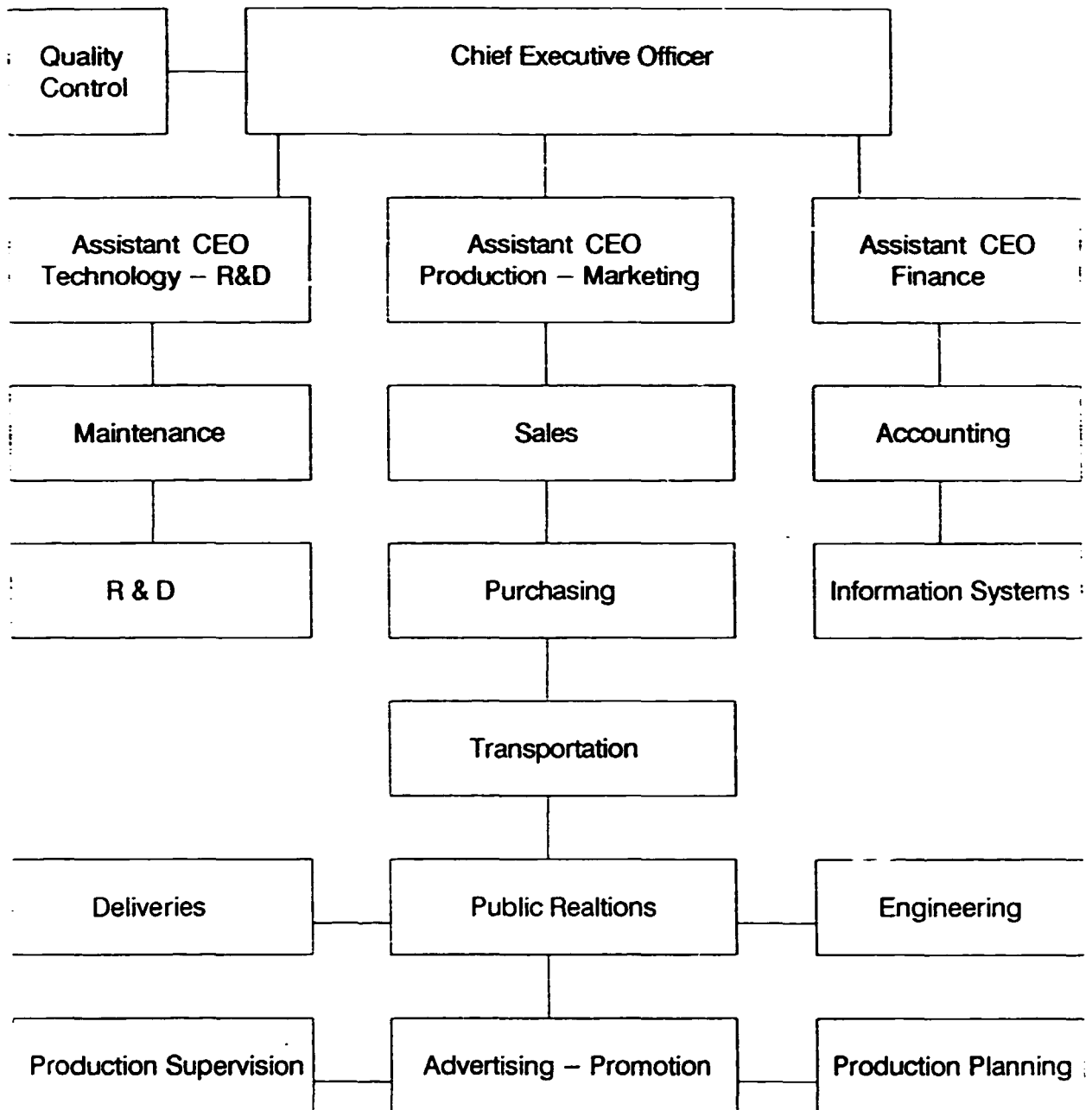
APPENDIX 4

EXISTING ORGANISATIONAL STRUCTURES

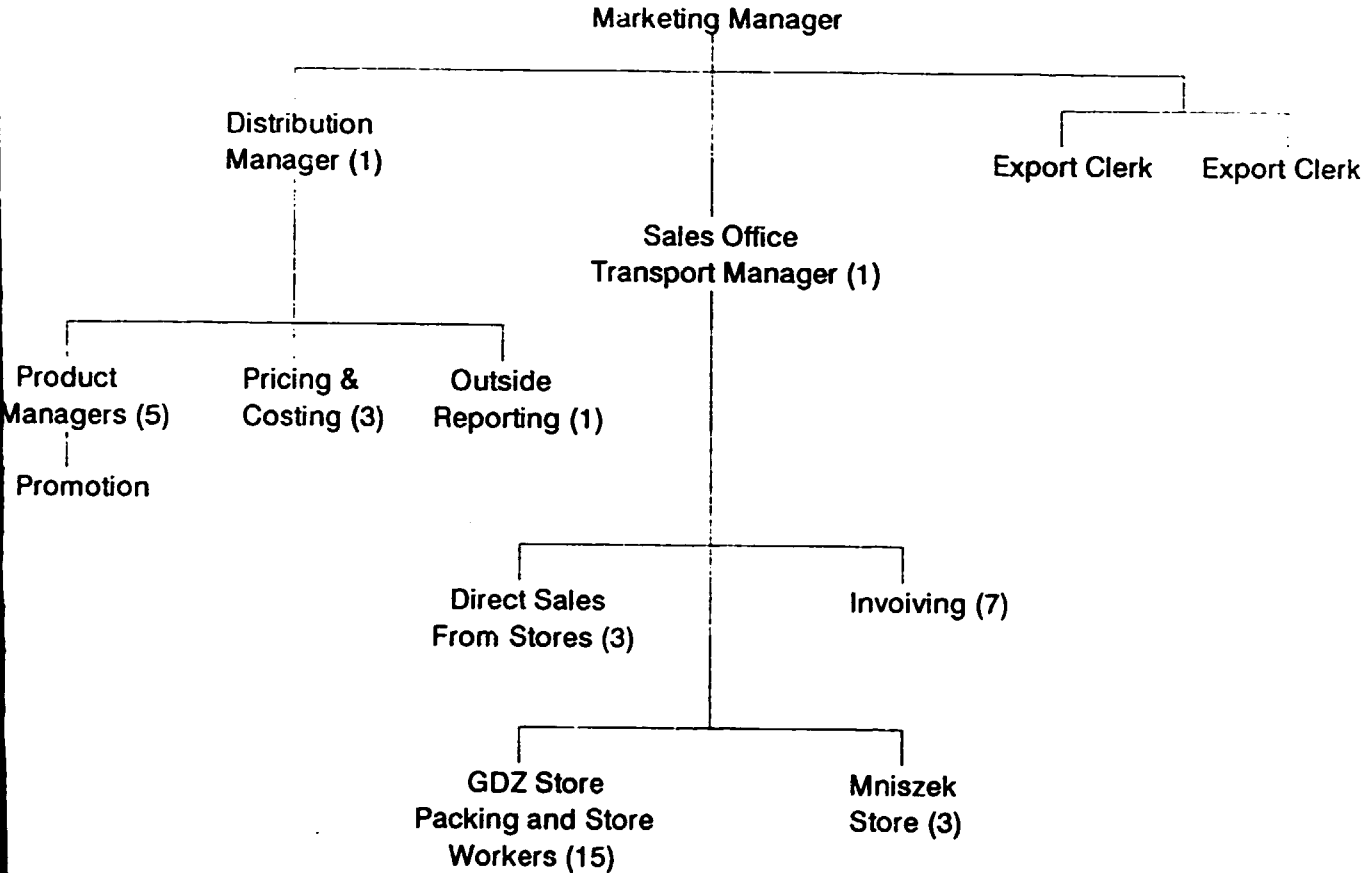
1. HYDRO-VACUUM

2. MARKETING DEPARTMENT

EXISTING ORGANISATIONAL STRUCTURE



MARKETING DEPARTMENT: EXISTING ORGANISATION
FEBRUARY 1992



APPENDIX 5 THE POLISH WATER INDUSTRY

A5.1 LEGISLATION

Prior to 1989, Poland had a comprehensive set of laws and regulations designed to control and manage the environment. Although this legislation had been in place for more than two decades, it was insufficient to counter the strong political and economic pressures for industrial development. The law was widely ignored and failed to provide the necessary system of protection for the environment.

The new legislation transforms the previous legal structure, creating new levels of responsibility and considerably improving enforcement. It incorporates basic principles designed to encourage the preservation and rational management of natural resources. The most relevant laws, some of which have yet to be approved by the Council of Ministers, include:

- a) A new "Water Law" (repealing the present Act of the same name), introducing changes in the water management system, changes in ownership, and the development of local self government. The law seeks to control the exploitation of water resources; for example ground water (which is usually of the highest quality) should be used mainly for human consumption and certain branches of the food industry which require clean water. The law also lays down maximum permissible levels of contaminants in industrial effluent discharged into surface waters.
- b) The Natural Environmental Protection Law which regulates problems currently embraced by the existing Act on the Protection and Shaping of the Environment and the Act of Protection of Nature.
- c) The Forestry and Forest Management Law, replacing regulations presently contained in various Acts, primarily stressing the environmental functions of forests.
- d) The Geological and Mining Law, replacing outdated legal Acts ensuring environmental protection in the exploration for and exploitation of mineral and fossil resources.
- e) The State Inspectorate of Environmental Protection Act, a new law which will transform this institution into a strong centralised organ with broad rights in policing the environment.

Separate legal Acts are planned to cover waste management. In addition, regulations will be extended concerning extraordinary menaces to the environment, through their adaptation to the legislation covering threats to human life and health, to nature and the national economy.

In the past, environmental protection failed as a result of very weak enforcement, rather than legislation itself. The Government is correcting this by looking closely at enforcement. In addition to watertight legislation, it will need to develop efficient mechanisms to ensure compliance with the law and to resist being blown off course by powerful forces in the economy and industry.

A.5.2 STANDARDS

Poland is adopting European Community standards on the environment. The objective is to introduce these standards over the next 10 years to allow for the financing and construction of water plant and equipment necessary to meet the new standards. The Council of Ministers has to approve directives for new "executive orders" on standards. Broadly speaking they will control the influx of pollutants into water and into ground and air. A permit is required for each plant discharging waste into the environment. Some commentators claim that certain standards, such as those on nutrients like phosphorus compounds should not be imposed in the immediate future, because industry cannot afford to meet them.

A.5.3 INDUSTRY ORGANISATION

A.5.3.1 The Status of the Water Enterprises

The traditional operators of water supply and sewerage systems were provincial enterprises responsible to the local bodies. There were 51 such provincial enterprises. They provided an integrated service ranging from water provision to water treatment and discharge. In addition, many also operated communal heating systems.

Under the provisions of article 5 of the law of May 10 1990, the enterprises have become the property of the Communal District Councils (of which there are approximately 2000), who have to determine an organisational and legal form for the enterprises. State enterprises which administered communalised property have maintained their legal status while turning into communal enterprises. This means that the ownership of their assets is passing from the state to the local communities.

In additions, since the law of privatisation of July 1990 (article 45), municipal enterprises may be partly privatised by offering a maximum of 49% of the shares which are now held by the communal district instead of the provincial "state" Government, to third parties (including employees). The municipality retains a 51% majority shareholding.

It appears likely therefore that some municipal authorities will sell off part of their services to private companies (e.g. waste water treatment plants or heating systems), moving away from the option of integrated management. Such action seems contrary to Government plans for integrated environmental management of natural resources. It is not clear what control will be exercised by the communal district council.

The fees charged to water users vary considerably. The fees and penalties are discretionary; communal district councils are expected to adjust them to reflect the cost of supplying water and treating waste water. In Warsaw, the rates have soared from 8 Zl/m³ in 1989 to more than 2300 Zl/m³ in July 1991, causing protests among users.

A.5.3.2 Water Management Councils

A key objective of the Government is to develop a structure which promotes the integrated management of river basins. The Government plans to establish 7 water management councils to co-ordinate management in the industry. A pilot study based on the upper Vistula river basin (comprising 11 administrative regions or voivodships) has been developed for this purpose to serve as a model for the other regions in Poland. Each of the river basins will be managed by a Water Management Council, co-ordinating the local administrations.

A.5.4 MUNICIPAL AND INDUSTRIAL WASTE WATER

A.5.4.1 Waste Water Discharge

Overall Discharges

The total discharges of municipal and industrial waste water into surface waters came to 12.3 km³ in 1989, of which 9.9km³ was industrial waste and 2.4km³ municipal waste. Almost 8 km³ consists of cooling water from industry, which although generally free of pollutants, can have a major impact on

the ecological balance of rivers through temperature changes. When waste water is treated, the most common method is mechanical (1.5 km³). Very small amounts of water get chemical treatment (0.3 km³), while biological treatment is used on 1.1 km³ of water.

Under ideal circumstances, industrial, municipal and agricultural waste water should receive individual treatment processes. Industrial effluent with distinct contaminants should be treated at source, before entry into municipal systems. Industrial waste in particular differs from municipal and agricultural waste since it often contains specific compounds such as heavy metals, oils, solvents and other chemical compounds, which requires special treatment and management. A large proportion (about 30% on average and varying between 10% and 80%) of this industrial effluent is discharged either into rivers or through the municipal sewerage system. The remainder appears to be disposed of in landfill sites. Some receives basic pre-treatment before being discharged.

Industrial and Agricultural Effluent

The main sources of water pollution are industrial and agricultural. Although little is known about agricultural pollution, concern is growing about the effect of mineral fertilisers, which has been blamed for the increase in nitrates, phosphates, potassium and calcium. Other forms of pollution in rural areas are linked to municipal sewage discharges and effluent from livestock farms.

Out of about 5000 water consuming industrial plants (i.e. plants for which the aggregate consumption is more than 59 million m³ of water daily) 48% lacked any waste water treatment whatsoever and another 10% had waste water treatment plants of insufficient capacity. Four sectors of industry dominate the volume of effluent discharged into surface waters:

- * power (about 150 plants);
- * chemicals (139 plants);
- * metallurgical (45 plants);
- * paper (103 plants).

Other industrial sources of pollution include the food industry, particularly the sugar, potato and dairy industries which discharge organic substances.

Municipal Effluent

The total volume of sewage discharged via municipal sewage systems in 1989 was estimated at 2.4 km³. Treated municipal sewage amounted to 1.3 km³, including 0.8 km³ of biologically treated waste water, leaving 1.1 km³ sewage discharged without any treatment into surface waters.

The lack of waste treatment infrastructure is a major problem in Poland. In 1989, 1.1 km³, about 45% of the domestic sewage was discharged into surface waters without treatment. The effluent has a large volume of suspensions of organic and inorganic compounds which normally require both mechanical and biological treatment. The 55% "treated" effluent (1.3 km³) mainly underwent mechanical treatment, because of a limited biological treatment capacity.

The expansion in water supply infrastructure between 1960 and 1989, which increased the demand for municipal sewage treatment, was not accompanied by appropriate provision in waste water systems. In 1989, the situation was as follows:

- * 109 towns had no sewerage network;
- * 157 towns with a municipal sewerage system had no waste water treatment purification plants installed;
- * 459 towns had sewage treatment plants with insufficient capacity.

As previously mentioned, many municipal waste water systems also carry industrial effluent. The largest discharges of industrial effluent into the municipal water systems are in industrial towns and districts, such as Katowice, Warsaw, Lodz and Wroclaw. These areas also have significant problems related to the proliferation of industrial waste dumps, originating from extractive and power industries. There are fears that contamination from these dumps, which are often illegal, is affecting both surface and underground water sources.

A.5.5 WASTE WATER TREATMENT

A.5.5.1 Number of Treatment Plants

Only a very small proportion of waste water receives "95% or more pollutant reduction" i.e., adequate treatment. There is certainly potential for substantial growth in the waste water sector. Poland currently has about 800 large waste water treatment plants, compared to the estimated 3000 that are

needed. Of these, about 700 plants are urgently required; it is estimated that this would reduce the pollution by about 85%.

A.5.6 INDUSTRIAL EFFLUENT TREATMENT

Most types of industrial effluent, more than domestic effluent, require treatment beyond mechanical purification. Yet the majority of treatment plants only remove suspended or insoluble contaminants. In 1989, about 66% of total industrial discharge was treated mechanically. Only 26% of industrial effluent received secondary or tertiary treatment.

An estimated 445 million M3 of untreated industrial effluent was discharged into surface waters in 1989. 90% of this volume originated from 44 industrial plants, each producing about 10 million m3 annually. 9 plants produced more than 5 million m3 each year.

Only about half of industrial discharges in 1989 received even basic mechanical treatment (1006 million m3). Chemical and biological treatment was applied to 12% and 14% of the total respectively. 35% of industrial facilities have limited or no waste water treatment systems. When the discharge is into the sewerage system, the burden falls on the municipal treatment plants.

A.5.7 MUNICIPAL EFFLUENT TREATMENT

The total treatment capacity of the municipal sewage system was 4.4 million m3/day in 1989. 366 towns, of the total 825, lacked sewage treatment plants. A total of 577 plants were functioning (some major towns have more than one plant), of which 204 were low efficiency mechanical treatment plants with a high degree of overload.

For both types of treatment plant (mechanical and biological) those with a capacity of less than 5000 m3/day outnumber plants of other sizes. Only three plants had a capacity of more than 100,000 m3/day. Only 3 plants had a capacity of more than 100,000 m3/day: Gdansk - 180,000 m3/day, Krakow - 132,000 m3/day, and Elblag - 106,000 m3/day.

Among the plants that are functioning, many are operating within a very wide range (both below and above) of designed capacities. Of the 373 mechanical-biological plants, 150, or 40%, were operating at below 80% capacity. 41 plants were overloaded by a factor of two or more.

Almost all the towns with populations in excess of 200,000, of which there are 20 in total, now have sewage treatment plants. The last major towns of these sizes in need of a plant to meet demand were Warsaw, Lodz, Bialystok and Radom. They have either started building new plants or are in the process of awarding contracts.

There remains a potential demand of about 20 to 25 plants for towns with populations in excess of 20,000 people. If small towns with populations of 5000 upwards are included, there are in total about 150 towns (between 5000 and 200,000 inhabitants) lacking sewage treatment plants. Western European contractors have won contracts in the major towns to build the large treatment plants. Although there are more opportunities in the rural areas to build plants, they are smaller and probably less attractive to the major companies. For smaller companies or specialised suppliers, business with the smaller towns is likely to be less competitive.

A.5.8 OPPORTUNITIES IN THE POLISH WATER INDUSTRY

A.5.8.1 Water Supply

Poland's population of 38.2 million consumed a total of 15.1 km³ of water in 1989 for industrial, agricultural and municipal purposes. Municipal use came to 3.01 km³, equivalent to individual water consumption levels of 216 litres per person/day. There are 825 towns in total but the population is evenly distributed and there has been some investment in the supply to rural communities. Industrial use was 10.4 km³ in 1989, which seems extremely high, accounting for almost 68% of total consumption. 80% of this is used in the power sector. There are water deficits in most large towns, especially where large concentrations of industry occur. Examples of towns with water deficits include Lodz, Legnica, Krakow, Kielce, Lublin and Szczecin.

The most urgent requirements are to control industrial consumption and reduce pollution of the water supply. In order to reduce wastage of water and improve water supply, a closer link will be established between water usage and costs. This implies management and organisational changes in the supply and management of water and a very extensive range of technical measures. Industrial water consumption is the biggest challenge. Less water has been consumed as a result of the economic crisis affecting Poland, but significant reductions can only come from investment in new process control technologies, which consume less water and discharge better quality water.

When the organisational changes become effective, structural changes in consumption patterns may start to develop. Lowering levels of industrial water consumption will take longer than reducing municipal water usage. There will be more income for the water providers, which they can use for investment. Some authorities have generated income and have funds to invest immediately. These funds can be supplemented by other sources e.g. national environmental funds.

In most towns, the water supply fails to meet demand in either volume or quality; the daily deficit (national average) is 11%, though this rises to about 30% during the summer months. More than 12% of the water consumed in towns is considered "unsafe" (does not meet class three in Polish standards, which means that water is contaminated and permitted pollution levels exceeded). The only real and cost effective solution to this problem is to reduce the influx of pollutants in the water. 33 towns are without piped water supply; 30% of rural communities have no water supply; an estimated 7.5 million people draw water from wells.

Water losses from the network amount to an estimated 11% of the water consumption. An increase in the rate of water losses between 1975-1989 is attributed to the poor condition of pipes and other parts of the supply infrastructure, resulting from a combination of factors including deterioration of pipes and joints, faulty materials or construction methods, lack of maintenance or neglect.

To reduce network losses, economic methods of inspecting and repairing pipes are needed: there are opportunities for suppliers of inspection and trenchless repair technology. A number of companies are known to be seeking business in this sector.

In general terms, there are opportunities in the following areas:

- rehabilitation of trunk mains, equipment (e.g. submersible pumps) and water purification plants;
- the construction of new reservoirs and purification plants using modern technology, e.g. ozone treatment and chlorination;
- monitoring and metering water consumption, controlling water losses/wastage;
- closed water systems, especially in the energy and steel sector, to improve water efficiency in industry;
- low-cost technology, "portable" units for rural communities with 100 to 1000 houses;
- technology to reduce water losses (e.g. trenchless repair systems).

A.5.8.2 Waste Water

The major needs are:

- sewerage systems for towns and villages: 17,000 km of municipal and 22,900 km of rural sewerage systems up to year 2000;
- 900 large municipal and industrial liquid waste water treatment plants - capacity 8.8 million m³/day and a further 1000 plants after the year 2000 (9.9 million m³);
- 3 major cities with more than 200,000 (Lodz, Bialystok and Radom) have incomplete treatment facilities; and
- rehabilitation and repair of sewerage networks, dewatering systems, sludge disposal, toxic waste disposal, filters, presses, dewatering, incineration, desalination.

Industry

Opportunities exist both within process systems and in the treatment plants required to clean the effluent they produce. In many circumstances, replacing or upgrading the process technology utilised is a more efficient and rational solution to the problem.

Investment in processing will make the plant more efficient and profitable, probably reducing other forms of pollution such as atmospheric, ground and noise, which also cause harm to water resources. Benefits usually include lower water and energy consumption and improved quality and smaller quantities of water discharged. Industries involved in the treatment of organic waste, fertilisers and pesticides, plastics, pharmaceuticals and chemical fibres require specialist equipment to improve the exploitation of water and other resources. Such equipment is an integral part of any measures taken to tackle industrial effluent pollution.

During the last major survey carried out in Poland covering 4840 plants, almost half were found not to have treatment plants. Of these large industrial plants:

- 2508 have liquid waste treatment plants, although 208 have insufficient capacity;
- 445 have none at all; and
- 2285 have sufficient capacity.

Only 25% of industrial effluent receives chemical and biological treatment.

Municipalities

There are major opportunities in waste water treatment in a number of areas in Poland, but in general terms, western Poland is the area where the problem is greatest.

The largest discharges of industrial effluent into the municipal sewage system occurred in:

- * Katowice - 82 million m³
- * Warsaw - 61 million m³
- * Lodz - 55 million m³
- * Wroclaw - 31 million m³

In 1990, three major cities with population in excess of 200,000 people had incomplete sewage treatment facilities; these are Lodz, Bialystok and Radom. However French companies are building a treatment plant in Lodz.

Major conurbations such as Gdansk-Gdynia-Sopot require water investment:

- * the largest plant is at Gdansk-Plonie which processes 180,000 m³/day;
- * Gdynia has two plants: one is to be dismantled, and the remaining one has only mechanical treatment;
- * Gdansk-Stogi is to be dismantled.

Apart from mechanical facilities which are a large potential source of business in themselves, none of the major cities have constructed tertiary treatment facilities. Most towns have a problem with dewatering, sludge treatment and disposal and solid waste disposal. There is a very large potential for technologies which are not capital intensive and which minimise sludge creation.

Opportunities for such systems and related equipment could exist in the following:

- * Sendzimira and Czestochowa steel works;
- * most coking plants;

- nitrate plants in Kedzierzyn, Pulawy and Tarnow;
- chemical plants in Oswiecim;
- cellulose and paper plants in Swiecie, Klucze, Niedomice and Wloclawek;
- high output power stations (some use for water cooling purposes).

APPENDIX 6

NOMINAL AND EFFECTIVE PROTECTION ANALYSIS

This technical appendix provides a more detailed description of the methodology followed in chapter 8, which focuses on the assessment of the impact of the protective environment in Poland on Pomorska's operations.

A.6.1 NOMINAL PROTECTION

If there were free trade and no distortions to production and consumption, the domestic price of a good would equal its international price. The amount that domestic prices exceed international prices therefore, represents the nominal protection provided to domestic producers. Underlying the analysis therefore is the fundamental premise that raised tariffs on competing imports allows domestic producers to raise their prices on the domestic market up to the elevated level. As a result domestic prices become divorced from (elevated above) world market prices.

It is assumed therefore that in general there is a causal relationship between raised import tariffs and raised prices (and ultimately costs) of domestic producers serving the domestic market. However this relationship is a complex one. For it is evident that a domestic producer actually faces two choices in the face of raised import tariffs on competing imports.

Firstly, as is most often the case, the domestic producer can indeed raise prices to the level possible under the new import tariff regime. Over prolonged periods, as the domestic price becomes progressively elevated above the world price and the incentive to maintain efficiency becomes increasingly faint, it is likely that the production costs of the enterprise start to rise, eventually precluding its viability to compete under the lower price structures characteristic of international markets.

However there is also the possibility, (which is far less likely), that the producer will price up to the new levels possible under the import tariff regime but still remain an efficient cost structure by international standards, or choose not to price up to the elevated levels, but instead elect to sell at below the elevated domestic price in order to increase sales volume and maintain the ability to export.

Analysis of nominal protection provides an indication of the cost environment facing enterprises within the Polish domestic market, relative to world markets, but cannot predict how individual enterprises actually react to these stimuli.

The nominal rate of protection (NRP) can be defined as follows:

$$\text{NRP} = \frac{p^d}{p^w} - 1$$

where p^d and p^w are domestic and world prices respectively.

A.6.2 EFFECTIVE PROTECTION

As has been mentioned in the main text, the effective rate of protection (ERP) is an extension of the NPR concept and summarises the net effect of the incentive structure on the value added for a particular product. It compares value added in domestic prices with value added at border prices. ERPs identify the extent that the incentive structure allows domestic producers to increase their value added above that achievable when inputs and output are valued at border prices.

As previously mentioned, increased domestic value added allows domestic producers either to make greater profits and collect higher rents or have higher production costs than would be the case without protection. Analysis of ERPs gives an insight into the effect the incentives structure has on the manufacturing sector, at the enterprise level. In particular the impact of protection in reducing competition, increasing monopoly profits and decreasing competitiveness and labour productivity.

If more than one enterprise is under scrutiny, ERP analysis can also provide an insight of the relative resource allocation effects of protection. The ranking and dispersion of ERP estimates are likely to provide policy makers with reliable guides to these resource effects in an economy. Resources are likely to be pulled away from activities with low effective rates, which have reduced scope for monopoly profits, toward those with high effective rates and greater profit potential. A direct implication of this is that by protecting import-substitute activities, export activities are taxed. This is of relevance for both the policy maker and the individual industrial enterprises in question.

Furthermore effective protection analysis can provide a basis for considering whether the protective or incentive structure is consistent with the objectives of industrial and trade policy. It may indicate relatively strong incentives for activities which are unlikely to achieve import-substitution or export-promotion. Alternatively it may indicate relative resource pulls between sectors of the economy which are incompatible with other industrialisation objectives.

These broader issues are not being considered in the context of this analysis however, as the focus is on a single enterprise in a single sector. ERPs are affected by both the policy environment and enterprise specific factors such as the structure of labour cost, the degree of material import dependence and the technical characteristics of production. The following numerical example illustrates these relationships.

Example: Salt

(million Z)	Domestic Prices	Nominal Protection	Border Prices
Value of Output	4,894	36%	3,599
Value of Inputs	3,534	0%	3,534
Value Added	1,360		65

Defining the effective rate of protection as:

$$ERP = \frac{VA^D}{VA^W} - 1 \times 100\%$$

Where: VA^D is value added in domestic prices

VA^W value added in world prices

gives:

$$ERP = \frac{1360}{65} - 1 \times 100\% = 1992\%$$

In the example, the activity is essentially a mixing operation with little value added in border prices. Tariff and non-tariff protection give a nominal protection of 36% on output, while that on inputs is zero because these are imported duty free. The system of incentives and the structure of production combines to allow domestic value added to be very much greater than international value added. The activity is therefore able to make either larger profits or have higher costs than international competitors.

Effective protection analysis has focused attention on the possibility of negative effective protection. Tariffs on intermediate, imported inputs may be sufficiently in excess of those on the final good so as to disprotect the activity. Finally, there is the possibility of zero or negative world value-added in some activities. This occurs when the cost of intermediate inputs exceeds the value of the final product when both are valued at world rather than domestic distorted prices. Evidence of this is a strong initial guide at least to the net costs of excessive or inappropriate protective structures; i.e. to the maintaining of activities domestically which are uncompetitive internationally.

In the context of this study, the tariff-based ERP quantifies the expected effect of the current incentives regime in Poland, on company operations. It is this figure therefore which should be considered by policy makers. The price-based ERP is also of interest as it reflects H-V's (positive) international competitiveness despite the handicaps enforced upon it by the domestic structure of incentives. However the polarity of the ERP (whether it is positive or negative) should be considered in place of its absolute value.

A.6.3 ANTI-EXPORT BIAS

The definitions of anti-export or trade regime bias that are most widely accepted, and typically employed by trade economists, relate to the pattern of relative incentives that apply in a given economy. Indeed the definitions of trade regime bias and trade strategy can be determined simultaneously. Thus a trade strategy based upon import substitution (IS) is one which provides a pattern of relative incentives that draws resources into the domestic production of importables and away from the production of exportables and non-tradeables. IS policies do this by raising the average price (nominal or net) of domestic goods (that compete with imports) relative to the average price of other goods produced by the economy. In real terms, therefore, the real (effective) exchange rate for importables (ER_m) is raised relative to the real (effective) exchange rate for exportables (ER_x) by an effective IS strategy. Thus if:

$$[1] \quad ER_x < ER_m$$

or alternatively if

$$\frac{ER_x}{ER_m} < 1$$

there is a "bias against exports".

Anti-export bias is measured therefore by the extent to which policy interventions lower the relative price of exportables; relative that is to the price of importables. There are several very important features of this definition of anti-export bias. First, trade regime bias is a **relative** concept. It is quite possible for a country to be employing specific policy instruments that are designed to promote exports, but still to have a trade policy regime which induces an overall bias against exports because the measures used to promote importables dominate the export promotion measures.

Second, any anti-export bias can be reduced by implementing measures that raise the absolute price of exportables and/or lower the absolute price of importables. Third, while measures that lower the amount of anti-export bias might be described as export-promoting (relative to the prior situation) genuine export promotion requires that there is a pro-export bias as measured by the relative price of tradeables. If some anti-export bias remains, so-called export promotion measures are better thought of as partially compensatory export measures only.

A.6.4 THE EXTENT OF ANTI-EXPORT BIAS

The extent of trade regime bias is determined therefore by the extent to which policy interventions raise the domestic price of importables relative to the price of exportables. Rather than try to measure effective exchange rates, the methodology used here measures anti-export bias in more detail by using the results of the effective protection analysis.

In the absence of multiple exchange rates and starting with uniform world prices of importables and exportables, an index of trade regime bias or anti-export bias (B) can be written as:

$$[2] \quad B = \frac{1 + e_x}{1 + e_m}$$

Thus if average protection rates are uniform across sectors ($e_x = e_m$) then B is unity, while B is less (greater) than one as the protection rates for exportables is less (greater) than that for importables. Note that there is no anti-export bias ($B=1$) for uniform protection at any absolute level i.e. if $e_m = e_x = 0\%$ or if $e_m = e_x = 50\%$ etc. Note also that although anti-export bias increases (i.e. the index falls) for a given e_x value as the rate of protection of importables increases, nevertheless a higher absolute level of protection for exportables does not necessarily reduce anti-export bias if the value of e_m increases by a larger amount. (For example if $e_x = 10\%$ and $e_m = 30\%$ B equals 0.85, while when $e_x = 30\%$ and $e_m = 60\%$ B equals 0.81 - with a lower B value indicating greater bias.)

A.6.5 DOMESTIC RESOURCE COSTS

Domestic resource costs (DRCs) represent measures of economic efficiency and provide, to some extent, indicators of comparative advantage. As a result they are useful tools for the policy maker, whilst of interest also to the corporate planner. They contrast the economic values of the domestic primary factors (i.e., capital and labour) used in production, with value added at world prices, which is notionally equivalent to the returns that would be realised by labour and capital internationally. In one sense, this measures the value of domestic resources used in saving or earning foreign exchange: activities that entail the use of resources worth more than the value of foreign exchange saved are economically inefficient while activities that cost less than they save are seen as efficient. In practice, the analysis of DRCs is more appropriate for examining the relative economic efficiency of activities rather than determining this in absolute terms. And in this sense it is a less powerful indicator in the context of this single enterprise analysis. However, in contrast to measures of NRPs and ERPs, which are indicators of the signals given to consumers and producers, DRCs can be seen as measures of social profitability and have less direct implications for developing an efficient policy environment.

The short run DRC may be expressed as:

$$(6) \quad \text{SR DRC} = (\text{CFL} * \text{WL})/\text{VAWP},$$

where CFL is the conversion factor reflecting the adjustment to reflect estimates of shadow wages; WL is the market price of labour used in production; and VAWP is value added measured in world prices. In this study, four skill-classes of labour have been used in deriving the economic value of labour: managerial; administrative; skilled; and unskilled labour. (However it should be noted that it was not possible to undertake a detailed analysis of shadow prices.) The estimates for conversion factors for shadow wages are:

- Managerial 1.0;
- Administrative 1.0;
- Skilled Labour 0.68; and
- Unskilled Labour 0.68.

Clearly it was beyond the scope of this project to calculate shadow wage rates in detail. The shadow rates quoted are taken from a limited study of the Polish labour markets undertaken during the course of the fieldwork.

Ordinarily, foreign labour employed would not be included in measures of domestic resources. As the available evidence suggests that there are very low levels of foreign labour employed in the industrial sector, this issue has not arisen.

The long run DRC may be expressed as:

$$(\bar{r}) \quad \text{LR DRC} = ((\text{CFL} * \text{WL}) + (\text{CFK} * \text{RK})) / \text{VAWP},$$

where CFK is the corresponding conversion factor for capital services to reflect the social discount rate and RK is an estimate of the capital stock employed in production multiplied by the market rate of return. (i.e., in principle a measure of the market value of capital services used in production).

The economic discount rate (EDR), which reflects the rate of return on the marginal unit of public investment and the economic opportunity cost of capital has been estimated at 13.2 percent, which effectively represents the international cost of capital.

A.6.6 PRICE COMPETITIVENESS INDICES (PCIs)

Price competitiveness indices provide perhaps the most useful indicators for corporate planners, as they are designed to assess the likely effects of policy changes upon enterprise performance or, more precisely, to more clearly separate underlying patterns of competitiveness from the influence of policy interventions. The common basis for each of the five indices is a comparison between world and domestic prices with the latter being adjusted to eliminate a variety of possible distortions.

Thus the first index (PCI_1) is largely a benchmark measure, measuring the domestic price of a particular good in relation to world prices. Both prices are actual current prices such that PCI_1 is given as :

$$\text{PCI}_1 = P_d / P_w$$

where P_d is the domestic price of a particular good and P_w the world price. Note that this provides an inverse measure of the current price competitiveness of Poland in the particular industry - the lower the value the more competitive Poland in the production of the particular good.

However, any particular price can be treated, under certain assumptions, as the sum of a number of component elements. Specifically these elements are traded inputs (T_d), non-traded inputs (N_d), labour costs (L_d) and capital costs (including normal profit) (K_d). These different components can be gradually revalued at world or at shadow prices to provided adjustments of the domestic price (P_d). These adjusted or "notional" domestic prices are, then, a measure of the domestic price that would be likely to prevail in the absence of distortions in the particular input market.

The second of these measures (PCI_2) seeks to eliminate the effects of interventions in goods markets by revising tradeable inputs and the tradeable component of non-tradeable inputs at world prices. Thus, PCI_2 is given by :

$$PCI_2 = \{ T_w + N_w + L_d + K_d \} / P_w$$

where T_w and N_w are tradeable inputs revalued at world prices and non-tradeable inputs where the tradeable component has been revised at world prices. This measure, therefore, assesses the likely degree of competitiveness that would prevail in the absence of direct distortions in tradeable goods markets.

The third measure (PCI_3) extends this revaluation procedure to isolate the effects of labour market distortions alone. Thus, PCI_3 is given by :

$$PCI_3 = \{ T_d + N_d + L_{ds} + K_d \} / P_w$$

where L_{ds} is the unit labour cost revalued at the shadow wage rate. Thus, PCI_3 varies from the benchmark of actual price competitiveness (PCI_1) only by the revaluation of the labour component.

The fourth measure (PCI_4) similarly revalues the benchmark measure of PCI_1 to reflect only the effect of capital market distortions such that :

$$PCI_4 = \{ T_d + N_d + L_d + K_{ds} \} / P_w$$

where K_{ds} is the shadow price of capital.

Lastly, the final measure (PCI_5) adjusts domestic prices to reflect distortions to both factor markets and in tradeable goods. This is, therefore, defined as :

ASSUMPTIONS		CONVERSION FACTOR	
SHADOW PRICES		ADJUSTMENT TO NON-TRADED GOODS	
1. Managerial	1.00	Electricity	1.0000
2. Administrative	1.00	Wear & tear	1.0000
3. Unskilled manual	0.80	Transport & distribution	1.0000
4. Unskilled manual	0.80	Rent & rates	1.0000
5. Capital	0.80	Repairs & maintenance	1.0000
		Marketing & sales	1.0000
		Depreciation for the year	1.0000
		Interest charges	1.0000
		All other expenses	1.0000
Currency Unit (Q. n)			

DEFINITION OF VALUE ADDED	yes=1 no=0	Note: 1 includes the indicated variable from value added and include it in input costs. Conversely 0 includes the indicated variable in value added and excludes it from input costs.
Excluding		
Depreciation & interest	0	
All other expenses	0	

CALCULATION OF EFFECTIVE RATES	yes=1 Using actual duty paid on inputs	no=0 Note: 1 means duty paid on inputs used to calculate domestic and world value of inputs 0 means scheduled tariff rates used

TARIFF SCHEDULE RATES	CET	Domestic PTA
Band 1 - primary goods	15.00%	15.00%
Band 2 - intermediates	15.00%	15.00%
Band 3 - final goods	15.00%	15.00%

Percentage Min Wage 140000
 Legal Min Wage 70000

Shadow/Labor Rate 0.670428032

Shadow Price of Capital
 LABOR + 3% (= 10.1675+3) 13.1675%
 (assume capital for new projects has 0% overruns)

ASSUMPTIONS		CONVERSION FACTOR	
SHADOW PRICES		ADJUSTMENT TO NON-TRADED GOODS	
1. Managerial	1.00	Electricity	1.0000
2. Administrative	1.00	Water & fuel	1.0000
3. Skilled manual	0.88	Transport & distribution	1.0000
4. Unskilled manual	0.88	Rent & rates	1.0000
5. Capital	13.18%	Repairs & maintenance	1.0000
		Marketing & sales	1.0000
		Depreciation for the year	1.0000
		Interest charges	1.0000
		All other expenses	1.0000

Currency Unit (Z. m)

DEFINITION OF VALUE ADDED	yes=1 no=0	Note: 1 excludes the indicated variable from value added and include it in input costs. Conversely 0 includes the indicated variable in value added and excludes it from input costs.
Excluding:		
Depreciation & interest	0	
All other expenses	0	

CALCULATION OF EFFECTIVE RATES	yes=1 Using actual duty paid on inputs	no=0	Note: 1 means duty paid on inputs used to calculate domestic and world value of inputs 0 means scheduled tariff rates used

TARIFF SIMULATION RATES	CET	Dollar PTA
Band 1 - primary goods	15.00%	15.00%
Band 2 - intermediates	15.00%	15.00%
Band 3 - final goods	15.00%	15.00%

Permanent Min Wage 1100000
Legal Min Wage 780000

Shadow Labor Rate 0.67942832

Shadow Price of Capital
LABOR + 3% (= 10.1875+3) 13.1875%
(assume capital for new projects from overseas)

$$PCI_5 = \{ T_w + N_w - L_{ds} + K_{ds} \} / P_w$$

This measure, as with all the price competitiveness indices, provides an inverse measure (the higher the less competitive) of the likely competitiveness of Polish, (in this case H-V's) production in the absence of distortions.

A.6.7 FURTHER ASSUMPTIONS INHERENT IN THE METHODOLOGY

Many of the techniques described above involve assessing the impact of government trade and industrial policy on various aspects of enterprise efficiency. Many involve the measurement of the impact of policy intervention on input costs which in itself typically raises several issues:

A.6.7.1 The Shadow Price of Labour and Capital

Estimates of the shadow price of labour and capital are important in calculating the ERP, DRC and PCI results. The shadow price of labour selected in this case reflects the difference between Pomorska's monthly minimum wage levels and the estimated aggregate wage obtainable in the agricultural sector if legal minimum wage requirements are not observed. Similarly the shadow price of capital, representing the "real cost" of capital was estimated on the assumption that the majority of capital for the funding of new projects is coming from overseas. It is therefore calculated taking the London Inter Bank Offered Rate (LIBOR), plus a risk spread.

A.6.7.2 The Treatment of Nontraded Inputs

Price-increasing trade restrictions also tend to raise the domestic prices of nontraded goods that may be used in production. It was not possible however, to estimate the average price distortion for the most important nontraded goods (c.g., electricity, transport, water) in Poland and hence these have been based on data for the costs structures of a similarly protected economy. These data suggest that on average, nontraded prices are 18% above what they would be in the absence of trade restrictions.

A.6.7.3 Technical Efficiency and Amounts of Raw Materials Used in Production

A second issue concerns the production technology and the measurement of input costs per unit of output. We have followed the standard approach of implicitly assuming that production methods reflect existing domestic practices and would remain unchanged under less restrictive policy interventions.

It is analytically feasible to introduce assumptions regarding the substitution between types of raw materials and between materials and factors of production. These extensions of the methodology generally have only minor effects on the results and rest on rather tenuous assumptions that would be difficult to substantiate. However, to the extent that more liberal economic policies would increase the levels of competition under which domestic firms operate, it would be expected that technical efficiency would be improved generally.

A.6.7.4 The Use of Accounting Data

The data on input use have been drawn from accounting data which reflect purchases during H-V's accounting year. In principle, data for actual raw materials used in production is required and typically this will not correspond at the firm level to purchases. Purchased raw materials not used in production will increase inventories and conversely, materials from inventories may be used in production. Detailed data on inventories were not available although estimates of the total change in stocks of raw materials were obtained. These data were used to proportionately adjust data on purchases to more closely correspond to amounts of inputs used in production.

APPENDIX 7 MANAGEMENT INFORMATION BULLETIN

This consists of month and year to date reports on 30 sheets, produced by the 20th of the following month.

- 5 sheets comprehensive financial data relating to the past month with cumulative year to date figures;
- 2 sheets month and year to date figures showing the build-up of items of general overhead expenses to a total for the company;
- 5 sheets month and year to date figures showing production and cost of production of each main product group with separate figures for exports;
- 1 sheet similar figures for other sales items, together with figures showing work-in-progress and finished goods stocks.
- 2 sheets figures showing numbers and costs of claims for repair work carried out under warranty, monthly and cumulatively, for each main product group, both in numbers and percentages.
- 12 sheets Key indicators of performance, monthly and cumulatively for each production department.
 - Z11 - Pump Assembly
 - Z21 - Foundry
 - Z22 - Enamelling
 - Z23 - Machine Shop
 - Z25 - Coal Stoves
 - Z3 - Wabrzezno
- 3 sheets key indicators as above but for overhead service departments:
 - Electrical maintenance
 - Mechanical maintenance
 - Tools and dies

**APPENDIX 8
OVERSEAS MARKETS SUPPLIED BY H-V 1986-1991**

COUNTRY	PRODUCTS SUPPLIED
USSR	G SK & SPARES
EAST GERMANY	G & SPARES
CZECHOSLOVAKIA	SK & SPARES
BULGARIA	PUMPS & SPARES
HUNGARY	PUMPS & SPARES
ROMANIA	PUMPS & SPARES
MONGOLIA	PUMPS & SPARES
CUBA	PUMPS & SPARES
CYPRUS	PUMPS & SPARES
CHINA	PUMPS & SPARES
EGYPT	PUMPS & SPARES
FINLAND	PUMPS & SPARES
FRANCE	PUMPS & SPARES
GREECE	PUMPS & SPARES
NETHERLANDS	PUMPS & SPARES
IRAN	PUMPS & SPARES
IRAQ	PUMPS & SPARES
INDIA	PUMPS & SPARES
KUWAIT	PUMPS & SPARES
KOREA	PUMPS & SPARES
LIBYA	PUMPS SPARES & BATHTUBS
MALTA	PUMPS & SPARES
MEXICO	PUMPS & SPARES
NORWAY	PUMPS & SPARES
WEST GERMANY	PUMPS SPARES & DRINKING BOWLS
SWEDEN	PUMPS & SPARES
TURKEY	PUMPS & SPARES