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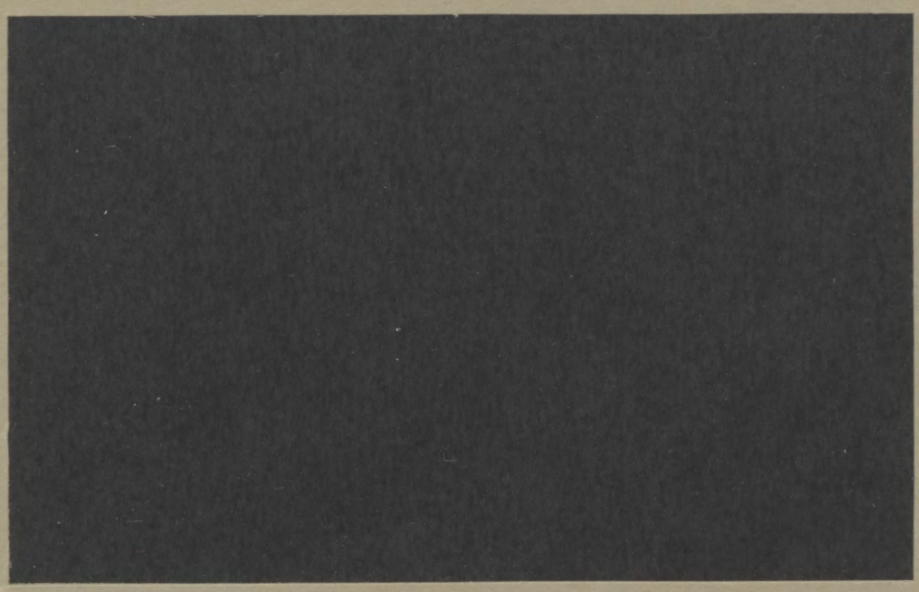

International Labour Office, Geneva

WEP 2-41/WP.12

WORLD EMPLOYMENT PROGRAMME RESEARCH

Working Paper

DISARMAMENT AND EMPLOYMENT PROGRAMME

Working Paper No. 12

REDUCTION IN ARMAMENTS PRODUCTION: LESSONS TO BE DRAWN FROM ADJUSTMENT TO STRUCTURAL CHANGE IN THE SHIPBUILDING INDUSTRY IN THE FEDERAL REPUBLIC OF GERMANY

by

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November 1989

8588d/v.2

ISBN 92-2-107332-7

First published 1989

Printed by the International Labour Office, Geneva, Switzerland

Preface

In the final series of studies commissioned by the Disarmament and Employment Programme, a methodological approach has been adopted based on the analogy of armaments conversion with other types of industrial adjustment. In the recent past, there have been many experiences of once major industries in certain countries falling considerably in terms of output and employment. Steel and shipbuilding in the OECD countries represent some of the best known examples, but there have been many others.

These so-called sunset industries, and the regions and countries affected by their decline, had to look for optimal strategies and for the most appropriate forms of intervention to mitigate the impact of the crisis. Although the armaments industry differs in many important respects from civilian industries and the causes of decline are different the handling of the crisis can nevertheless, teach many useful lessons for defence cuts and for defence industrial conversion.

Four country/industry combinations have been selected for examination, namely the shipbuilding industry in the Federal Republic of Germany, the chemical industry in France, the steel industry in Sweden and the automobile industry in the United States.

In this study, Dr. Werner Voss of the University of Bremen analyses the crisis in the West German shipbuilding industry. He highlights its causes and examines its various consequences, particularly for employment. He offers a detailed survey of the strategies adopted by different shipyards in the face of the decline of their branch of activity, which once was the leader of economic development in the north German coastal areas. He illustrates trade union attitudes and policies and studies the impact of various types of government measures taken to cope with the crisis. He assesses the effectiveness of the decisions and strategies adopted by enterprises, trade unions, state and federal governments and analyses the causes of their success or failure. In the final part of the study, he draws a number of practical lessons from the shipbuilding crisis in the Federal Republic of Germany, which are of real value to all those interested in defence industrial conversion and, more generally, in industrial restructuring methods and in the impact of structural change on enterprises and local labour markets.

Peter J. Richards

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Foreword

This report analyses strategies for crisis management, focusing on the experience of West German shipbuilding companies during the first 15 years of civilian shipbuilding difficulties. It examines the question of whether lessons can be drawn for possible reductions in arms production.

A number of methodological objections can be raised against the attempt to draw parallels between the experience of two production branches particularly when they are as different as civilian shipbuilding and the armaments industry. Civilian vessels are constructed for a market that, unlike most others, is relatively transparent. Both the shipping companies which place the orders and the shipbuilding companies which construct the ships according to their requirements, know international production conditions, including manufacturing costs and prices of vessels. In addition, both the contractor and the customer have a profound knowledge of financial arrangements and subsidy practices in the different shipbuilding countries. The products themselves are relatively homogeneous. Many types of vessels are produced at comparatively low levels of technology. Production technologies used in shipbuilding have become relatively uniform over the past few decades. Barriers to entry to the market are low. The international shipbuilding market has become a buyer's market. Therefore, West German shipyards must compete against shipbuilding enterprises from numerous countries in the world.

In contrast to this, the arms industries of the major industrialised countries are largely oriented to national requirements. In all market economy countries, the armaments market is characterised by a close inter-relationship between private and public arms enterprises as contractors and the government departments concerned (defence ministries, procurement authorities). Internationalisation of arms production and a truly competitive market environment has not occurred so far, despite numerous political declarations and statements of intent.

To many people, the support of a national arms industry is a prerequisite for the maintenance of national sovereignty, and if large sums have to be spent on security, then domestic companies should profit as much as possible. Jobs are to be retained according to the motto "no money across the border". Because of these and other reasons, the armaments market has a number of special features: setting arms export apart, the government is the sole customer of the arms industries. It provides considerable assistance to them, usually financing a large proportion of the research and development activities. If weapon systems overcome parliamentary hurdles then production series are frequently long. During production series, weapon manufacturers mostly enjoy relatively stable levels of orders. Since product performance is more important than cost, military contracts are generally based on a cost-plus basis. Instead of economic criteria, political contacts with the government dominate in the armaments market. This is also true of the co-operation on international projects.

Apart from these market-specific differences, time factors also limit the usefulness of transferring the experiences of the shipbuilding crisis to possible armament cuts. Social and ecological environments in a society change daily - especially in free market societies. Yesterday's experiences may prove of little relevance for tomorrow's problems.

Despite these drawbacks, however, lessons can be drawn from the shipbuilding crisis for defence cuts. In fact, the West German shipbuilding industry is an interesting case for the study of industrial restructuring,

particularly of defence industrial conversion, in view of its regional concentration, the size of enterprises, the employment structure, and the role of interest groups. In order to draw conclusions from the adaptation process currently taking place in the shipbuilding industry for possible cuts in the armaments industry, all these aspects have to be carefully analysed.

Although a lot has been said about the crisis in the West German shipbuilding industry, precise information about the diversification processes at the yards is scarce. This is explained by the circumstances. The interest of the parties involved - managements, trade unions, employees, as well as government authorities - have focused primarily on the maintenance of shipbuilding activities. The few attempts at diversification and the problems associated with it remained secondary.

In order to palliate the inadequacy of data, direct contacts were established with the managements of the larger shipyards to gain first-hand knowledge about the experience and difficulties of the restructuring process. Thyssen Nordseewerke, Blohm and Voss and Bremer Vulkan readily answered all questions put to them. No information was received, however, from the Howaldtswerke-Deutsche Werft management, despite repeated attempts. Important information came to light in the interviews conducted with the representatives of the first three firms. The author would like to express his thanks to these representatives who were willing to be interviewed.

In order to fill the information gaps and to include additional shipyards in the survey, a number of institutions were approached. Of particular help were Dr. Robert Kappel and the economist Andreas Hübscher of the Institute of Shipping Economics and Logistics in Bremen and Dr. Heiner Heseler from the Kooperationsbereich Universität/Arbeiterkammer Bremen who assisted the author in the collection of statistical data and provided bibliographical references and many useful suggestions. Particular thanks are due to Dr. Michael Brzoska who was an adviser to the project and read the entire manuscript.

1. Introduction

For about a century, shipbuilding was a basic component of industrial activity on the northern West German coast. The peak of ship construction in this region was reached in 1975, which was a boom year for shipbuilding world-wide; neither before nor after were more ships built in West Germany. The subsequent decline (postponed in some cases till the beginning of the 1980s) meant that the yards not only in the Federal Republic of Germany but in the whole of Western Europe have been faced with the stigma of a sunset industry.

After the abolition of most of the post-Second World War construction bans in the 1950s, the shipbuilding sector was one of the fastest growing industries in the Federal Republic of Germany. This boom lasted for two decades. However, shipbuilding in West Germany did not reach the status of a major industry like automobiles. In 1980, the shipbuilding sector consisted of 119 enterprises with 138 production sites.[1] The number of employees was about 58,000. Ten years earlier, employment had still been at 80,000. In the late 1980s, the number of employees had declined to about 33,000.

In the early 1970s, shipbuilding was concentrated in the four coastal states of the Federal Republic of Germany and constituted a very important economic factor in these states. In Bremen, shipbuilding represented almost 20 per cent of manufacturing production, in Schleswig-Holstein and Hamburg about 10 per cent. Although the share was below 10 per cent in Lower Saxony as a whole, the construction of vessels was concentrated at a few sites such as Emden where its weight was very important. The above figures exclude workers employed in subcontracting firms, often situated near the yards.

Between 1972-79, the five largest yards taken together represented 70 per cent of the total turnover in West German shipbuilding. These five yards were Howaldtwerke-Deutsche Werft (HDW) (state-owned as part of the Salzgitter group) with production sites in Kiel and Hamburg; Blohm and Voss (owned by the German Thyssen corporation) in Hamburg; AG Weser (owned by the Krupp company) with plants in Bremen and Bremerhaven; Bremer Vulkan (owned by the German-Dutch group Thyssen-Bornemisza) in Bremen; and Thyssen Nordseewerke (owned by the German Thyssen corporation) in Emden. All large shipyards have been part of steel-producing corporations, which had diversified into vessel construction in the 1920s or earlier. During the crisis of the 1970s and 1980s, however, the Thyssen-Bornemisza corporation withdrew from the shipbuilding business and Krupp reduced its activities in this branch.

The concentration in the four coastal states explains why the contraction of shipbuilding has been a matter of public concern in North-West Germany. The struggles and measures taken to counteract the decline of the industry received much attention and support from the people in the affected regions and cities. Employers and employees, in co-operation with the local and regional authorities, gained considerable strength as a pressure group. Until April 1983, there was an unusual alliance between the metalworkers' union, IG Metall, the Federation of the Shipbuilding Industry and the four state governments of the coastal states. Trade unions called it a "strange coalition".[2] The target of this tripartite co-operation was to call upon the federal Government in Bonn to stabilise demand and to avoid the collapse of shipbuilding "in a Keynesian way". The basis for the political demands were the studies carried out by regional and federal governments, unions and shipbuilders at that time, which prophesied a boom in shipbuilding some years later. Their strategies all aimed at riding out the storm and reaching better times, following the cyclical upswing, with capacities largely intact.

At the beginning of the crisis, in the mid-1970s, all attempts to manage the recession were directed to short-term measures. Employers reduced workforces in socially acceptable ways without much resistance from the unions. The fall in demand for merchant vessels rarely lead company managers to invest and expand into other civilian markets that might secure employment. Both the federal Government and the directly affected state governments aimed their substantial assistance programmes - encompassing several hundred million Deutsch marks - at improving the competitiveness of the West German shipyards. In addition, the Federal Ministry of Defence farmed out an order for the construction of six frigates among the five major shipyards in the late 1970s. The purpose of this measure was to stabilise the remaining employment at the large yards, and to avoid further unemployment. The West German armaments control laws were changed and export of naval ships was made easier.

Restructuring initiatives received only feeble support, as the general opinion was that a renewed upswing in demand would follow within a relatively short time. The prevailing conservative attitude was that the existing know-how could be profitably applied to the firms' own benefit, if they concentrated on the marketing of special ships. However, increased competition from newly industrialised countries even in this market which became apparent in the early 1980s gradually revealed the structural character of the crisis. It was only then that measures were adopted which could be of real interest for the study of defence conversion. Many restructuring processes, however, are still incomplete, and cannot be therefore finally evaluated.

This report describes first the development of the world shipbuilding market during the last two decades. It goes on to provide a description of the structural changes and of the present situation of the shipbuilding industry in the Federal Republic of Germany. Then it analyses the reactions of the main decision-makers - the federal and local governments, the Federation of the Shipbuilding Industry and IG Metall, the metalworkers' union. The third chapter focuses on the policies and diversification measures in selected yards, i.e. in all the large companies. Lessons to be drawn from adjustment in shipbuilding are outlined in the fifth chapter. The possibilities of applying these findings to the armaments industry are discussed in Chapter 6.

2. Shipbuilding - a world-wide market in crisis

As late as 1955, the centre of international shipbuilding lay in Western Europe. Approximately 70 per cent of all vessel tonnages were built there. British and West German yards, in particular, occupied a leading position. Since that time, the share of these two countries, and of Western Europe generally, in world shipbuilding has steadily declined. At the same time, a new production centre arose in South-East Asia. Between 1955 and 1970, Japanese yards increased their share of the world shipbuilding market from 11.3 per cent to 48.1 per cent, and in 1975 they built half of the world tonnage (see table 1).

Table 1. Selected shipbuilding data, 1955-87

	1955	1960	1970	1975	1980	1985	1987
World total in 1,000 grt (cgrt)	4 967	8 382	20 980	34 203	12 635*	13 671	9 242
	grt(cgrt) -% of world completions						
EEC (10)	70.0	n.a.	25.9	22.9	19.2*	12.0	15.2
of which:							
Fed. Rep. of Germany	19.5	13.4	6.3	7.3	4.7	4.6	4.3
United Kingdom	26.6	15.5	6.3	3.4	3.6	1.2	1.8
Japan	11.3	21.9	48.1	49.7	41.2	47.8	41.1
Rep. of Korea	n.a.	n.a.	0.0	1.2	3.5	11.8	12.9

* Since 1980 the data have been provided in compensated gross registered tonnage (cgrt). The differential input of work is taken into consideration according to vessel types, e.g. tankers and special ships.

Source: Annual report of the French Shipbuilders' Association, cited in: Detlef Rother: "The restructured West European shipbuilding industry", Institute of Shipping Economics and Logistics Bremen, Bremen, 1985, p. 11 and Institute of Shipping Economics and Logistics Bremen, Shipping statistics, Yearbook 1988, Bremen, 1988, p. 291; own calculations.

Between 1955 and 1970 the gains of Japanese companies on world markets were detrimental to West European companies. The structural changes in the shipbuilding market occurred within the sphere of the developed market economy countries. But, since the world construction of ships continued to expand in absolute terms, this change had little direct consequences for the Western European and particularly West German shipyards, the output of which continued to grow (although at a slower rate than would have been the case in the absence of South-East Asian competition).

The crisis of the late 1970s was preceded by an immense boom in demand. From 1970 to 1975, the production of vessels measured in gross registered tonnage (grt), increased by more than 60 per cent. The main reasons for this boom were the enormous purchases of tankers by shipping companies. Within a short period of time, a doubling of the share of oil tanker construction among total ship construction was registered (table 2). The increase in shipbuilding during the early 1970s was almost exclusively due to the increase in construction of oil tankers; and the slump in shipbuilding following 1975 was initially foremost a tanker construction crisis.

Table 2. Merchant ships completed, by principal types, 1975-87

	1975	1980	1985	1987
Total in 1,000 grt	34 202	13 101	18 157	12 259
		of which in %		
Oil tankers	66.4	30.1	15.1	24.9
Carriers	18.3	22.5	49.6	35.5
General cargo ships	8.1	20.6	13.9	18.1
Container ships	0.7	10.5	8.4	9.2
Liquid gas and chemical carriers	2.5	6.6	3.3	1.6
Others	4.0	9.7	9.5	10.7

Source: Lloyd's Register Annual Summary of Merchant Ships Completed: various issues.

Between 1980 and 1985, the delivery of vessels world-wide ranged from 12.5 to 15 million of compensated gross registered tonnage (13 to 18.5 grt). The value of deliveries sank to a level of 12.1 cgrt in 1986 and 9.1 million cgrt, i.e. 12.2 million grt in 1987. This represents the lowest delivery level for more than 20 years. At the same time, total orders declined. The decrease in construction and in new orders for vessels is the result of the large overcapacity in the majority of shipping markets, coupled with low freight rates and the financial exhaustion of many traditional shipping companies. The attitudes of banks and financial institutions further exacerbated the situation. Because of negative experiences with the risky financing of ships, many financial institutions adopted a more restrictive financing policy. Generous allocation of credits for vessels, which had been the usual practice until 1985, seems to belong to the past.

International production structures changed again during the 1980s. There was an influx of new, thus relatively minor, shipbuilding nations, which managed to gain footholds and to establish themselves in this market, within the framework of industrialisation policies. Shipbuilding capacity increased in newly industrialised countries like the Republic of Korea, Taiwan and Brazil. The Republic of Korea is, in the late 1980s, the second most important shipbuilding country of the world. In 1987, twice as many vessels were produced there than in Britain and the Federal Republic of Germany together. Relocation on the world shipbuilding market is no longer taking place between the developed market economy countries. Competition to Western European yards has grown particularly in the developing and newly industrialised countries.

As far as the West German shipbuilding is concerned, after a difficult restructuring period between 1958 and 1963, it was able to participate in, and profit from, the increased world-wide demand for ships from the mid-1960s onwards, despite a decreasing share in the world market. The first federal government aid programme was instituted during this phase and deemed instrumental in bringing this growth about. The accompanying rationalisation measures, yard closures and yard amalgamations prevented that increased orders were followed by an increase in the number of employees. This process of

"jobless growth" enabled the West German shipbuilding industry to maintain second position after Japan in world shipbuilding for a considerable period of time.

Even though the construction of oil tankers is technologically relatively undemanding, West German shipbuilding companies also entered this market during the early 1970s, when demand increased dramatically. Large yards changed over from the production of freight, special and container ships to tankers. The construction of supertankers and bulk carriers reached 50 per cent of all ship deliveries of West German yards in 1975. For the companies, this was a period of high profits. In the wake of the strong reduction in demand that followed, however, the companies' financial situation tightened and cost considerations became increasingly important. West German enterprises could no longer withstand Asian competition, due to their comparatively high wage and social costs. At the beginning of the 1980s, West German yards had completely withdrawn from supertanker construction. The production of West German shipbuilding corporations today concentrates on cargo vessels, container ships and passenger vessels. West German yards continue to be highly competitive in several sectors of the market for special ships.

Until the mid-1970s, it was easy to categorise the shipyards according to size as large, medium and small. The smallest among the large yards, Thyssen Nordseewerke, had about 5,000 employees, whereas the biggest medium-sized yard had less than 2,000 workers. In 1976, there were five large yards, 12 larger medium yards, 23 medium yards and 15 small yards.[3]

In the meantime, almost all the big yards have substantially reduced their workforces; AG Weser in Bremen was forced to give up its production completely. Yards of all sizes have been affected with about a dozen yards falling victim to the crisis and being forced to close their gates forever.

Table 3. Main West German shipyards

Name of the yard	Employment	
	1975	1988
Blohm and Voss AG, Hamburg	6 700	5 770
Howaldtswerke-Deutsche Werft AG, Kiel	14 700*	4 600
Bremer Vulkan AG, Bremen	5 600	3 000
Thyssen Nordseewerke GmbH, Emden	4 750	1 970
AG Weser, Bremen	4 700	**
TOTAL	36,450	15 340

* Including Hamburg production sites closed in 1988.

** Closed end of 1983.

3. Basic solutions for overcoming the crisis

In 1973, both the trade union representing shipyard workers, IG Metall, and the Federation of the (West) German Shipbuilding Industry (VDS) assessed the situation in West German shipbuilding optimistically. They shared the view that an investment programme was needed and that this had to be guaranteed by the Government. In other shipbuilding nations, subsidies were said to be considerably higher than in the Federal Republic of Germany. IG Metall was in principle for abolishing all subsidies, but considered that as long as subsidies existed in other countries, the Federal Republic of Germany also had to maintain them.

3.1 Subsidies and reduction in the number of employees

The signs of crisis in the West German shipbuilding industry could no longer be ignored by late 1974. Ship orders declined and previous orders were cancelled. Fewer vessels were delivered by West German yards in 1976 than in the previous year. Most suggestions for solutions aimed at bridging the recession: almost all affected groups believed the crisis to be cyclical, and expected a renewed upswing to take place within the next few years. The Federation of the (West) German Shipbuilding Industry demanded additional state assistance programmes for the yards and emphasised that the capacity for the construction of new vessels would have to be adapted to the changed situation of decreasing demand. The metalworkers' union IG Metall agreed to the restructuring, but coupled the call for investment aid with the call for job guarantees.

The federal and state governments developed diverse assistance and support programmes for the improvement of competitiveness and restructuring of the yards. Thus interest rate subsidies were provided for the yards from the budget of the Department of Trade and Industry in the framework of the eighth shipyard assistance programme. At the same time, the buyers of ships, the West German shipping companies, were subsidised in their acquisition of merchant ships produced by West German yards. The shipbuilding companies further received assistance from the Federal Department of Research and Development. On a state level, the shipbuilding industry received subsidies in the form of grants to companies, construction and adaptation measures, assistance to conferring of yard contracts, measures to improve the infrastructure, inflow of capital, research programmes, appraisals and valuations, as well as financial guarantees. The volume of these programmes and of the assistance is difficult to quantify. A study of subsidies in the West German shipbuilding industry found that between 1979 and 1984 alone, the financial assistance for shipbuilding contracts to the yards amounted to around DM500 million.[4] It must be noted that the practice of supporting the West German shipbuilding industry was initiated during the 1960s and extended in the course of the crisis.

The reduction in the number of employees was nevertheless accelerated. Between 1975 and 1979, the labour force employed by the yards shrank from 77,982 to 59,254, a reduction of about 25 per cent. Dismissals played a minor role. Early retirement within the so-called "59th year" rule,[5] the non-employment of apprentices after completion of their training, and natural fluctuation, facilitated a frictionless reduction of staff. Voluntary termination of employment was readily agreed to as a result of generous compensatory payments. Moreover, qualified skilled workers had greater opportunities in other industrial branches where there were sufficient numbers of vacancies during the 1970s. Hence, the resistance of the unions to such measures of job reduction was relatively moderate at the beginning of the crisis.

3.2 Demand for diversification and the results of diversification measures

The metalworkers' union IG Metall accepted job reductions provided they were implemented in a socially responsible manner. Demands for social compensation plans were soon supplemented by plans for investments in new areas of production. Public subsidies were to be made conditional on restructuring, and not granted without controls. The call for control did not mean that the trade unions refused to accept the market principles and private ownership. On the contrary, they asked the yard managements to consider mergers and co-operation in special areas such as marketing and research, for improving the competitiveness of the West German yards. IG Metall merely wanted employment to be given more consideration. According to the union, the inevitable loss of jobs in shipbuilding was to be offset by diversification of production at the yards and in the surrounding regions.[6] The creation of new jobs in alternative activities was to be subsidised by the Government.

In 1979, the Federation of the West German shipbuilding industry analysed the chances and risks of diversification in its annual report.[7] It was emphasised that the German shipbuilding industry had been dealing with the problems of diversification for many years. International analyses had been prepared by various yards and studies commissioned from research institutes and consulting firms. All agreed that diversification projects could only be carried out selectively, with comparatively small job effects. Job creation would be most effective if diversification projects were close to vessel construction. Moreover, diversification projects should be adapted to the existing structures of the yards. The characteristics of such structures were:

- proximity to the sea;
- equipment for processing very thick sheet-metal;
- capability to transport and process big and heavy work items;
- capacity for complex engineering:
- highly qualified workforce;
- close proximity of supplying/subcontracting plants.

This technological and economic profile of the yards was said to determine the possibilities for a successful shift to non-shipbuilding products. In addition, the Federation of the West German Shipbuilding Industry saw problems in the high degree of specialisation within branches of industry in the Federal Republic of Germany. It was therefore not very useful to become involved in destructive competition with corporations of other branches. The yards would have to develop new product lines with their own demand potential, which would be a risky and long-term process. In addition to diversification efforts, yards would have to maintain a minimum capacity for vessel construction during the crisis. As this double task would require a great amount of capital, the VDS report emphasised that small- and medium-sized companies might be financially overburdened. In principle, the take-over of companies with non-shipbuilding programmes was regarded positively in order to reduce risks in shipbuilding as the chances of corporations to survive the shipbuilding crisis would increase. However, the possibilities of job transfers within such companies were predicted to be low.

Given this quite pessimistic diversification prognosis, it is not surprising that success with new product ranges in the shipbuilding industry remained modest. Although the number of production hours at the West German

yards was reduced by approximately 50 per cent between 1975 and 1985, direct and indirect shipbuilding activities still dominated the production programmes. The share of non-shipbuilding output rose to 9.6 per cent in 1983 but fell again to 8.6 per cent in 1985 (see table 4).

Table 4. Production structure in West German shipbuilding

	1975	1983	1985
Hours of production (000's)	81 600	42 730	39 780
	of which in per cent:		
Construction of merchant ships	67.0	53.0	55.7
Repair of merchant ships	11.9	14.4	18.0
Construction of naval ships	3.2	11.1	5.0
Repair of naval ships	4.6	5.2	6.6
Supplementary shipbuilding production	7.4	6.7	6.1
Non-shipbuilding production	5.9	9.6	8.6

Source: Institut für Seeverkehrswirtschaft und -logistik (ISL), Untersuchung von Massnahmen zur mittel- und langfristigen Sicherung sowie zur kurzfristigen Stabilisierung einer leistungsfähigen, auslastbaren Ueberkapazität in der Bundesrepublik Deutschland vor dem Hintergrund der finanzierbaren national und internationalen Nachfrage, Hamburg und Bremen, 7 July 1986.

3.3 Changed circumstances

As diversification proved to be a long-term restructuring process, with few successes, and as the situation in the West German shipbuilding industry was worsening, the metalworkers' union IG Metall changed strategies. At the seventh national shipbuilding conference in March 1978 the union stressed that the shipbuilding crisis was a cyclical phenomenon and therefore preferred short- and medium-term measures to long-term restructuring plans. It argued that in the short term, capacity should not be adapted to low demand. Shipbuilding policy should primarily be one of a world-wide increase in demand, resulting in a protection of yard jobs. At that time, IG Metall called for an international agreement about demand and capacity. In the opinion of the union, the West German Government was to try to reduce international subsidies. As long as this strategy was not successful the Government was to continue subsidising the German yards. IG Metall then preferred direct aid to indirect subsidies. The hope was that the German yards would get more orders in spite of high production costs.

The chances to achieve more control and co-ordination on the international level had been slim from the beginning. On the one hand, an international co-ordination of capacities and subsidies seemed only possible within the framework of OECD. But many shipbuilding nations, e.g. Brazil, the Republic of Korea, USSR and Poland, were not members of this organisation. Therefore, the compulsory nature and scope of possible agreements was necessarily limited. On the other hand, experience had shown that it was impossible for the West German Government to influence even the national

shipbuilding industry. How could it influence the industry internationally? In the long run, only the call for more money from the federal Government remained realistic. Although the employers (VDS) did not favour direct subsidies, they did not resist them. Thus the deepening crisis in shipbuilding united IG Metall and VDS in a common campaign, supported by the state governments, for subsidies from the federal Government.[8] The federal Government met the demands of the union and of the shipbuilding industry favourably. New, extensive assistance programmes were provided by the federal and state Governments.

3.4 Reorientation unavoidable

Following a brief upswing in the early 1980s, demand in shipbuilding declined once more. As a result, the pressure to reduce production capacities increased. While during the 1970s only one small yard went bankrupt, numerous shipbuilding companies of all sizes were threatened this time. As the structural nature of the crisis became quite clear, the Federation of the (West) German Shipbuilding Industry repeatedly called upon the state and federal governments to increase the volume of subsidies and not to oppose significant reductions in capacities. Despite some disagreement with regard to the nature of the subsidies and the extent of capacity reduction, the four coastal state governments of West Germany agreed on a common stand. New subsidies were made dependent on the reduction of capacities by way of mergers and closures of divisions of yards. Considerable protests, including occupations of plant and worksites, followed, foremost by workers from the worst affected yards. The basis for common action between company managements, employees and their union representatives and the state governments no longer existed, and the "strange coalition" broke apart.

Although the differences between the conservative-liberal Government elected in 1982 and its social democratic-liberal predecessor were much smaller than political slogans would suggest, uncontrolled subsidies were cut back more and more. The new federal Government did not want to provide support of the size some state governments and the union called for. After IG Metall had put forward a plan to create new jobs in the coastal states ("coastal restructuring programme") to be largely financed by the federal Government, which was not accepted,[9] it introduced an overall growth and employment programme for discussion in 1983.[10] The volume of subsidies was put at a minimum of $10 billion a year. These proposals were made at a time when it was obvious that any hope of cyclical recovery in the West German shipbuilding industry was unrealistic. The political will or ability to spend public money decreased in direct relation to the increase in awareness that the contraction in shipbuilding was structural and lasting. The influence of IG Metall on public opinion decreased and the reactions to the crisis became more and more the matter for individual yards or their workforces. Individual state governments attempted to maintain their shipbuilding corporations and occasionally provided additional financial means for the yards. Such intervention was not always successful, as shown further below. In 1987, there were only about 33,000 workers employed at the yards. Of these, less than 13,000 were occupied in the construction of vessels.

3.5 Summary

The attitudes of the trade unions and the activity of the employees were strongly influenced by the experience of successful crisis management in the past. Because the federal Government had successfully overcome the decline in demand during the 1960s, state institutions were believed to possess a planning capacity that either did not exist in reality or was not practised.

The activities of the federal and state governments could rather be interpreted as reactions to the pressure of interest groups. Financial support measures played the key role here. Planned long-term restructuring was not pursued.

Company managements and the Federation of the (West) German Shipbuilding Industry alike put subsidies and adjustment measures, meaning chiefly job reductions, into the foreground of strategies for the yards. Adjustment measures were transferred to the company level. No reduction of capacity organised at the industrial or regional level took place. Each yard attempted as best it could to ensure its own survival. Even though the employees were considered to be sufficiently qualified, diversification measures within the shipbuilding companies bore little fruit. Although the number of work-hours was reduced by about half during the crisis, diversification did not even represent 10 per cent of the yard activities. However, this minimal degree of diversification may be due to reporting error or to legal complications. (When an establishment became legally independent and was predominatly active in non-shipbuilding it could not be included in table 4.) The extent to which different results can be obtained at the company level, and how they should be interpreted, will be illustrated by seven enterprise case studies.

4. Reactions of enterprises to cuts in demand

4.1 The extreme case: The closure of AG Weser Bremen-Gröpelingen

The closure of AG Weser in Bremen-Gröpelingen was one of the most spectacular events in the history of West German shipbuilding. For weeks the public took a lively interest in the demise of the Krupp-owned company. AG Weser had symbolic value beyond its immediate economic importance in the Bremen area. After the First World War, the revolutionary movement in Bremen had its headquarters at the yard. It was also the scene of a legendary announcement by post-war Major Wilhelm Kaisen in 1951, that most of the 1945 restrictions on West German shipbuilding had been abolished. For many years AG Weser had been one of the biggest yards in West Germany and the most important employer on the local labour market.

One week before the 1983 election of the local government in Bremen (senate) the employees occupied the 140-year-old yard. They wanted to force the social democratic senate to give guarantees that AG Weser would continue to exist after the election. But the government of the smallest state of the Federal Republic of Germany had already subsidised local shipbuilding to the extent of DM200 million, since 1975. Now its resources were exhausted. Therefore the senate felt that it was not in a position to save the yard. The occupiers could not influence public opinion in the direction they wanted. The Social Democratic Party won the election with an absolute majority. The workers gave up and AG Weser was closed at the end of 1983.

AG Weser in Bremen was more seriously affected by the crisis in world shipbuilding than other West German yards.[11] This was the consequence of a strategy of specialisation within the Krupp group adopted in the sixties: the building of new vessels such as large-sized oil tankers and bulk carriers was concentrated in Bremen-Gröpelingen, while the construction and repair of all the other types of standard and special vessels was centred at "Seebeck Werft" in Bremerhaven. Krupp invested almost DM100 million in Bremen-Gröpelingen to build up one of the most modern tanker yards in the world. In the beginning this strategy was very successful. Order intakes for more and bigger tankers, and profits, increased from year to year. In 1973, the management announced

that new ships for a total value of DM2.2 billion had been ordered. The yard never reached this level before or after.

Two years later the situation had changed dramatically. In 1975, the Hapag-Lloyd shipping firm converted the order for an oil tanker into an order for six cargo vessels. A Greek shipping company refused to accept the delivery of two tankers although it had already paid $40 million as a deposit. The AG Weser management reacted to the fall in demand by reducing its workforce. In 1976, the number of employees was cut by 613, in 1977 by 1,007 and in 1978 by 752. Two-thirds of the redundancies affected the Bremen yard.

According to the AG Weser management, the workforce reductions were possible without creating too many problems. Social compensation plans involving early retirement schemes and voluntary departures with compensation were sufficiently attractive to allow employment cuts without laying off workers involuntarily, until 1979.[12] The cuts mainly concerned office jobs, which resulted in a reduction of overhead costs. The research and development division was also closed. These measures reflected the management's forecast that in a few years' time the tanker market would pick up again.[13] Since the production facilities ranked among the most modern in the world, the AG Weser management saw no reason for further modernising the yard, or to prepare for fundamental adjustments to technologically more sophisticated shipbuilding products, or to move into other product areas. In the short run, the research and development division was only an extra expense. The closing of this division was a rational decision of a management pursuing a strategy of surviving in the tanker market with reduced personnel. But at the same time, the yard lost the capability for diversification. The survival of AG Weser-Gröpelingen was tied exclusively to the recovery of the tanker market.

Demand for heavy oil tankers did not increase, however, at the end of the seventies as anticipated by the management. Under even more difficult conditions the AG Weser management now made an attempt to restructure the yard. From 1981 to 1983 AG Weser tried to become competitive in the construction of so-called special vessels. About DM200 million, government subsidies and funds of the Krupp corporation, were invested. Because diversification activities had been concentrated at AG Weser Seebeckwerft and the research and development division in Bremen had been closed, no efforts were made to diversify to other products than vessels. Unfortunately, the shipbuilding market did not grow again. When the planned merger of the two big yards in Bremen, AG Weser and Bremer Vulkan, failed in autumn 1983, the Krupp corporation decided to close AG Weser, with 2,100 employees and 200 trainees becoming redundant at the end of that year. White-collar workers and all the workers who could not be dismissed due to collective agreements were given notice to quit at 30 June 1984.

The social compensation plan only included employment guarantees for 150 disabled employees at the Seebeck Werft in Bremerhaven. The Krupp management did not offer alternative jobs within the corporation to any of the AG Weser employees. Therefore most of the workers laid off had to look for jobs on the local labour market.

For over a decade, the economic situation and especially the labour market situation in the state of Bremen have been worse than in most other West German regions.[14] The deterioration started in the second half of the 1970s. Since then, the growth rate of GDP in Bremen has been below the national average and unemployment went up more than in other regions. The unemployment rate in Bremen is about twice the national average.

Under these circumstances, it is of particular interest to follow what happened to the dismissed AG Weser personnel. At the end of 1983, the unemployment rate in the district (comprising the city of Bremen and its surroundings) was close to 13 per cent. There were 32,567 unemployed. One year later that number had increased to 34,543. But these figures conceal the many different developments on the labour market. In fact, in 1984, 47,094 more people applied for a job at the labour exchange in Bremen than in the previous year.[15] Most of these people had worked before. They had either quit their jobs in the hope of a better one or had been dismissed. Forty-five thousand of the 47,000 unemployed found a new job during 1984. It is against this background that the mass dismissal of workers of AG Weser has to be seen: the share of the dismissed AG Weser employees in the total of registered jobless persons during 1984 was "only" about 4.4 per cent. In the following section, we examine the possibilities of former AG Weser employees to get re-employed and the conditions of their new employment. Some very interesting data are available on the subject from a survey conducted by the Kooperation Universität/Arbeiterkammer (a joint research institution of the University of Bremen and of the Labour Office in Bremen) on the whereabouts of former AG Weser employees, covering almost all workers concerned.[16]

Table 5. Situation of the dismissed AG Weser personnel two years after yard closure (summer 1986)

Shares of total dismissed personnel	Percentage
Not in the labour force:	17
of which:	
foreign AG Weser workers returned to their countries	7
in early retirement, retired, incapacitated	8
independent, deceased, not traceable	2
In the labour force:	83
of which:	
permanently unemployed	12
short employment after the closure and renewed unemployment	2
re-employed	66
AMB[1]/further vocational training/retraining	3

[1] The Arbeitsbeschaffungsmassnahmen programme (work creation programme) is based on the West German Employment Promotion Act of 1969. It provides temporary employmment for long-term unemployed, elderly or disabled persons. Employment is normally provided for one year but duration may be extended under certain circumstances. Since January 1988, the revised version of the Employment Promotion Act provides that persons over 50 years of age can be employed up to eight years. ABM projects are run through municipalities or non-profit-making organisations. The participants in the scheme are paid wages in accordance with collective agreements.

Source: Kooperation Universität/Arbeiterkammer (1987), p. 23.

The survey shows that in the summer of 1986, two years after the closure of AG Weser, 83 per cent of all dismissed employees were still active (see table 5). Half of the remainder had retired. About 135 foreign workers had left Bremen and gone back to their countries, seeing no chances to find a new job in the Federal Republic of Germany. Both groups must be added to the people directly affected by the yard closure.

Table 5 shows that 12 per cent of the workers dismissed in 1984 had not found any job by 1986, and 2 per cent were unemployed again after having worked for a short time. This group comprises mostly older workers, foreign workers and female employees. About half of the foreign workers and of the female office workers found no new job, while 41 per cent of the German workers aged 50-54 and 78 per cent of those aged over 54 were permanently unemployed. In the group of older workers the chances of re-employment were independent of skill and occupation performed while still employed at the yard.

During the first 18 months after the yard closure about 1,300 former employees found a new job. This was almost two-thirds of all the dismissed employees. About 470 workers found a new job in another company without ever being unemployed. Most of these were dismissed only on 30 June 1984, and had been able to take advantage of early notification. In fact, almost all of the workers dismissed on 30 June 1984 were able to start in a new job without work interruption.

Surprisingly, only 5 per cent of the workers who had been unemployed for less than three months found their new job with the help of the employment office. But the longer unemployment lasted, the more important was its role: about 15 per cent of those who had been unemployed for more than three months got a new job with the help of this institution. That means that most redundant AG Weser workers found a new job by searching themselves or through personal connections.

Almost half of the re-employed, however, indicated that their new income and their working conditions were inferior to those at the yard. Many former employees of AG Weser said that their new jobs were less interesting and more monotonous. They had to work much harder or the psychic burden was heavier. About 50 per cent of the workers and employees considered that their career chances had diminished. Only one-fifth of the re-employed said that their income and working conditions had improved.[17]

As indicated in table 6, an average of 40 per cent of the re-employed workers had to change their occupation. But, for the workers in occupations which are specific to the shipbuilding industry like shipwright or ship carpenter, this percentage was higher. The change of occupation was often accompanied by an occupational downgrading: 40 per cent of the skilled workers had to accept an unskilled job immediately after re-employment.

By 1986, over a half of the dismissed yard workers had found jobs in small- (29 per cent) or in medium-sized firms (26 per cent). Most of these firms were small yards, engineering establishments or steel girder construction firms. Five hundred and ninety of the re-employed workers (45 per cent) found jobs in large establishments again. Although the greatest employer in Bremen, the car manufacturer Daimler Benz, had offered to employ 1,000 retrained yard workers during the closure process, only 100-120 workers actually joined this company. As Daimler Benz increased its personnel by several thousands during the same period of time this may seem surprising. But only few of the yard workers met the company's selection criteria. Except for a limited number of skilled workers of German nationality around the age of 40 or below, nobody was hired. Some of the former AG Weser workers found jobs in two large local companies, Bremer Vulkan (shipyards; partly state

owned) and Stadtwerke (Bremen city's department of works). Both firms offered jobs to former yard workers, especially to those who had been unemployed for a long time.

Table 6. Change of occupation as a result of getting new employment after AG Weser closure

	Percentage of workers in each occupational category having to change occupation in new employment
Pipe fitter	58
Shipwright	51
Ships' carpenter/painter	48
Crane driver/engineer	47
Engine fitter	46
Steel girder constructor	41
Electrician	34
Other metalworker	26
Welder	17
All workers	40

Source: Kooperation Universität/Arbeiterkammer (1987), p.35.

In summary, the analysis of the AG Weser closure shows that the dismissed yard workers stood a significantly better chance to find new jobs than other unemployed: the average period of unemployment was shorter. One reason for this was that the former AG Weser workers were not seen as incompetent or unwilling; on the contrary, it was known that they had become unemployed not through their own fault or lack of skill.

In spite of the satisfactory reintegration of most of the former yard workers into the labour force many persons were seriously affected by the closure. Some groups were particularly hard hit, namely:

- older workers who were pensioned off much earlier than expected. Most of them suffered financial losses;
- foreign workers who had to go back to their countries with uncertain prospects;
- workers who became permanently unemployed. These workers were not only socially isolated, many of them suffered from financial and psychological problems;
- women workers who were unwillingly pushed out of professional life and back to household work.

In addition, re-employment meant an occupational downgrading for a sizeable part of the former AG Weser workforce. The workers having to accept lower category jobs not only suffered psychologically and financially, their

lower-level employment also caused a deterioration in the regional skill base and a loss of human capital.

In the final analysis, however, the fact that two-thirds of the workers found new employment can be considered as a positive feature of the AG Weser closure, especially if the difficult local economic situation is taken into consideration. Of course, while most of the 2,000 AG Weser workers found new jobs, the sudden increase in the number of jobseekers worsened the chances of other formerly unemployed people, because they were crowded out by the generally well-qualified redundant AG Weser workers.

4.2 Increased involvement of local government: The association of Bremen yards

After the closure of AG Weser-Gröpelingen, the remaining yards in Bremen and Bremerhaven tried to survive the shipbuilding crisis by a greater co-operation. With the help and support of the local government the companies gradually joined together under the leadership of the Bremer Vulkan AG and established the association of Bremen yards called "Bremer Werftenverbund".

Bremer Vulkan was founded in 1893. Until the beginning of the 1980s the yard was privately owned by the Thyssen-Bornemisza group. For a long time, Bremer Vulkan has specialised in the production of high-quality vessels. For example, the company built the first fully automatic vessel, the first container ship and the first vessel with a heavy diesel oil engine in West Germany. Bremer Vulkan participated successfully in the construction of oil tankers during the tanker boom. At the same time, the yard did not lose the skills and equipment necessary to produce more sophisticated vessels. This production sector is still the most important.

In the early stages of the shipbuilding crisis, the Bremer Vulkan management remembered its military tradition. During the Second World War, the company produced 74 submarines. In 1977, the West German Defence Ministry placed orders for six frigates. A long period of strictly civilian production came to an end. In the face of keen competition Bremer Vulkan was assigned as prime contractor, because it offered the most attractive price. The Defence Ministry required that four other large German yards become subcontractors in this project. In addition to its involvement in the construction of naval ships, Bremer Vulkan enlarged its business through the repair and maintenance of military vessels. In 1979, the company took over the small Neue Jadewerft GmbH in Wilhelmshaven. Many naval institutions are situated there.

The frigate order stipulated fixed delivery prices that Bremer Vulkan could not meet upon completion of the ships. Additional losses on a non-military order led the company close to bankruptcy. At the beginning of the 1980s, the situations of AG Weser-Gröpelingen and Bremer Vulkan were similar; hence both companies were threatened by closure. But Bremer Vulkan was saved by additional subsidies from the West German Government and by the intervention of the local state government.

In 1982, the senate of Bremen acquired one-third of the capital of Bremer Vulkan. One year later, at the peak of the merger negotiations in Bremen, the owner of Bremer Vulkan, Thyssen-Bornemisza, declared that he would not subsidise a merger of the two yards and offered his capital share to the local government. The symbolic price was DM1. The senate of Bremen became solely responsible for the survival of the Bremer Vulkan yard. After the closure of AG Weser-Gröpelingen, the local government used its new ownership function to influence the local shipbuilding industry in a more direct manner than had been possible through subsidies. The change of situation was reflected in the

appointment of a former civil servant, a senatorial director, to the post of board president. With the financial participation and political involvement of the senate, the shipbuilding industry was restructured under the leadership of Bremer Vulkan. Most of the yards in Bremen and Bremerhaven were merged into one association. The companies maintained their legal independence, but their activities were now co-ordinated.

The restructuring of the shipbuilding industry in Bremen took place in several stages. In 1984, Bremer Vulkan AG took over Hapag-Lloyd Werft GmbH in Bremerhaven. After a series of restructuring measures, ship repair and rebuilding were concentrated in Bremerhaven, while Bremer Vulkan kept the construction of vessels, mechanical engineering activities and non-shipbuilding production. One year later, the yard Schichau Unterweser AG (SUAG) in Bremerhaven became part of the "Werftenverbund". SUAG was primarily involved in the building of new ships and repair of specialised vessels. Its production programme included ferries, roro and general cargo vessels as well as liquefied gas and chemical carriers. In addition to shipbuilding and repair, SUAG produced flame-cutting machinery.

In autumn 1986, Seebeckwerft AG in Bremerhaven joined the "Werftenverbund". The company had been part of the AG Weser corporation until the closure of the plant in Bremen-Gröpelingen. In June 1984, the Bremerhaven company dropped its old name and set itself up as Seebeckwerft AG. The initial capital was almost DM34 million. The Krupp group remained the main stockholder with 90 per cent of the capital. Later, when the integration of Seebeckwerft AG in the yard association had been completed, the Krupp corporation took over a 13 per cent stake of Bremer Vulkan.

Meanwhile, the merger between Seebeckwerft AG and Schichau Unterweser AG had been decided. Both yards had a specific know-how in special shipbuilding of mostly similar types of ships, however of different construction sizes. The merger of the two companies under the name of Schichau Seebeckwerft AG thus represented a measure of adaptation to the reduced demand for vessels. Until 1990, the production facilities of the two yards are to be gradually united. These measures are part of a restructuring project of the "Werftenverbund", presented by the managing director of the Bremer Vulkan in 1988.

Jointly with the restructuring project the management announced the terms of reference for future activities and the basis for applying for public subsidies.[18] Against the background of a restructured shipbuilding market and continued global capacity reductions, the Bremer Vulkan management saw certain new perspectives for the remaining shipbuilding industry in the Federal Republic of Germany and especially in Bremen/Bremerhaven. In order to remain in the shipbuilding market, a programme of three points was adopted:

1. Production capacities of Bremer Vulkan AG, Schichau Seebeckwerft AG, Lloyd Werft Bremerhaven GmbH and Neue Jadewerft GmbH had to be reduced from 8,000 workers to 6,500 workers by the end of 1988. Altogether, the production capacities of the "Werftenverbund" would be reduced by 31 per cent.

2. The remaining capacities would be modernised and made competitive with the help of restructuring subsidies from the West German Government and the European Community.

3. Efforts would be made to diversify production and non-shipbuilding production would have the same status as shipbuilding production. On the basis of this project the association of Bremen yards is to be

transformed from a mainly shipbuilding venture to a shipbuilding, technology and service company.

The principal aim of the project has been to improve the chances for the yards in Bremen/Bremerhaven to carry on in high-quality shipbuilding. Vessel production has been considered indispensable for the Federal Republic of Germany and for its coastal states, particularly from the point of view of research and development, regional development and employment. In addition, the industrial experience and skills of 6,500 workers in Bremen/Bremerhaven were to be preserved, even if this meant a switch of production to non-shipbuilding sectors. In spite of more than ten years of crisis in shipbuilding, diversification effects had been rudimentary. In the short term, the management saw no possibilities to restructure production on a large scale. Diversification of the "Werftenverbund" was seen as a long-term goal. In the opinion of the management, construction of vessels would remain the dominant activity in the near future. By 1992, the structure of production should be the following:

- construction of vessels, 51 per cent;
- ship repair and rebuilding (both civilian and military), 27 per cent;
- military construction, 8 per cent;
- mechanical engineering and diversification, 14 per cent.

"Mechanical engineering and diversification" includes the production of components for shipbuilding, particularly of ship engines. The above figures indicate that the management does not view with optimism any possibilities of establishing non-shipbuilding productions in the short run. The management still gives priority to shipbuilding and most investments are to be used in this area. The investment funds spent on, or set aside for, restructuring amount to almost DM420 million. The planned structure of this expenditure is illustrated in table 7.

Table 7. Expenditure on restructuring planned by the Association of Bremen shipyards (DM million)

	Total	Of which: Government subsidies
Reduction of capacities	102.4	52.2
Productivity improvements	137.8	50.2
Diversification	155.3	58.7
Others (e.g. interest on loans)	23.9	15.1
Structural concept in total	419.4	176.2

Source: Bremische Bürgerschaft, Landtag, 12. Wahlperiode, Drucksache 12/245, 9 Aug. 1988.

About DM240 million are to be spent on improving the competitiveness of the shipbuilding sector. This amount contains compensation payments for early retirement and voluntary redundancies, as well as investments in new machinery (CNC machines), the installation of data processing equipment and spare parts storage. These measures are to be realised as early as possible in order to stabilise the financial situation. Once this has been achieved the Association of Bremen Shipyards should be able to finance one-third of the restructuring project expenses from its own resources. The difference between the total cost and available public plus private resources is to be financed through loans. After the lessons from the past, however, West German banks have become very cautious in lending money to the yards. It is quite likely, therefore, that the local government in Bremen will have to provide further guarantees to the "Werftenverbund".

As shown in table 7, DM155.3 million, or 30 per cent of the expenditure, is to be used for diversification measures. The management wants to diversify into the fields of environmental technologies, maritime technology, transport and specialised mechanical engineering. In the field of environment it envisages producing equipment for the incineration of special wastes, the reproduction of energy, flue-gas desulphurisation, the production of drinking water, treatment of sewage, reverse-osmosis, plant construction, disposal of harbour wastes, etc. As far as specialised machines and automation equipment are concerned, diversification possibilities might include bogies and hoists, presses, casting machines, production machines, heaters, containers, diesel engines, underwater robots and sensors. In the transport equipment field, the yards might switch to harbour cranes, container bridges, ship-unloading and quay equipment, tugboats, and mooring equipment. Finally, in the field of maritime technology they might try to establish a research and development centre in which new maritime products would systematically be developed. The centre would also support the shipbuilding activities helping them to increase their flexibility and productivity.

To co-ordinate these different areas of activity, a holding company has been established under the name of "Vulkan-Industrie".[19] The task of this holding company is to structure and control the activities of the dozen or so firms and company divisions that are active outside shipbuilding. Formally, the enterprises that are part of Vulkan-Industrie are to remain independent; the entrepreneurial responsibility stays with the individual firms. It is hoped however, that by bringing these different enterprises together under the central management of Vulkan-Industrie, the advantages of common marketing and of joint research and development efforts, as well as of joint managerial know-how, will have positive effects on the restructuring and diversification programmes. The non-shipbuilding companies and divisions have about 1,000 employees.

The management may utilise the existing know-how and experience which Bremer Vulkan, the other yards and some of the integrated smaller companies acquired in the past in the field of production diversification. A representative of Bremer Vulkan expressed the opinion that especially in non-shipbuilding production, new qualifications will increasingly be necessary. As diversification measures cannot work in market sectors where other firms already have an established lead, it is necessary to move into high technology areas requiring high levels of qualification.[20] Agreements have been concluded between the management and the Bremen senate for further education and training measures, utilising the existing work promotion law to enable workers to participate in training programmes.[21]

The reason why the Bremen yards reacted relatively late and on a minor scale to the need for diversification is, according to the representative of Bremer Vulkan, that restructuring required large investment and that in the

past funds had been primarily needed for the shipbuilding activities. He was of the opinion that the existing equipment and plants were ideally suited for shipbuilding but were hardly employable for other purposes. Furthermore, he felt that non-shipbuilding production could be carried out much more easily in a new production plant built especially for this purpose on an empty site next to the existing plant.[22]

In summary, after more than ten years of the shipbuilding crisis, the production programme of the Bremen yard combine still focuses mainly on the construction of new vessels and on ship repair. The involvement of the Bremen state government seems to have led to a stronger orientation towards diversification. But such efforts are, at present, relatively modest. If the problems in the shipbuilding sector threatened jobs and required swift action in the form of increased financing, then many diversification efforts might have to be given up. Meanwhile, the government of Bremen has sold a large part of its shares. Hence, the yard combine is once more largely in private hands. It is uncertain, however, whether there is a number of small shareholders or one large owner "behind the scene".

4.3 Restricted diversification through corporate strategies on subsidiary firms: Thyssen Nordseewerke GmbH

In the wake of the shipbuilding crisis, the Thyssen Nordseewerke yard (TNSW) reduced the number of employees from about 5,500 at the beginning of the 1970s to less than 2,000 in 1988. The corporation is still the second largest employer in the East Frisian harbour city of Emden (Lower Saxony), second only to a Daimler Benz plant. TNSW, founded in 1903, is a 100 per cent subsidiary of Thyssen Industrie AG, the latter being the industrial manufacturing division of Thyssen AG, one of the largest West German corporations. When Thyssen Industrie acquired additional shares of Blohm und Voss in 1986 - thereby becoming the majority shareholder - the managements of the Emden yard and Blohm und Voss were integrated. However, more substantial co-operation has so far not materialised.[23]

Over the past two decades, TNSW has both narrowed its field of specialisation and extended its production programmes into new fields. At present, production is divided into three sections of equal size: (i) naval shipbuilding; (ii) merchant vessel construction; (iii) repair, maintenance and engineering. In the area of merchant shipbuilding, the company is one of the world market leaders for the construction of gas tankers and ice-breakers. In the naval domain, it produces frigates and submarines. Lately, some diversification efforts were made based on experience gained in the construction of submarines, which will be further referred to below.

Thyssen Nordseewerke underwent a restructuring and a reorganisation of its production programmes in the early 1970s. The goal was to secure long-term economic viability by pursuing a strategy of "limited product flexibility".[24] The decision was made not to enter the giant tanker construction field. In the opinion of the management, this market seemed very risky. In addition, the small size of the sea lock in Emden limited the possibility of producing large vessels. So the yard concentrated on the manufacturing of special, technologically sophisticated vessels. The basic tenet of the enterprise was formulated by the then chairman of the board of management as follows: "Not tonnage fetishism but technologically and qualitatively high standard vessels, built at production plants that can be adapted with ease and at little cost, to changing demand - at a high level of staff qualification - are service advantages that will be to our benefit."[25]

Special shipbuilding has increasingly dominated in TNSN's production programmes. Apart from frigates and submarines, gas tankers, ice-breakers and special cargo container ships, the company has produced Baco liners in the last few years. An entry into the market for cruise liners was also attempted at the beginning of the 1970s, but without success. The management was dismissed and the company decided to opt out of this market. Step by step, TNSW has tried to diversify its activities. After the oil price increase in 1973, the extraction of North Sea oil became economical. Since then, the Emden yard has produced components for offshore systems, in partnership with Norwegian corporations. Because of the dimensions of the already mentioned lock, the construction of complete oil rigs has not been possible. Two larger development projects associated with offshore activities have lately gained significance. First, there is the sub-sea oil loading system (SOLS). Oil from storage depots under the sea floor is conveyed either through pipelines or by tankers. Oil transport by tankers requires either floating or fixed loading facilities. The utilisation of such cargo-handling buoys or derricks is heavily dependent on the weather, particularly in a rough sea such as the North Sea. Dependence on the weather could be substantially reduced by the introduction of SOLS. This system is also useful in marginal oilfields. Other areas of application are being investigated by TNSW after it received favourable reactions from oil companies and from shipping companies.

The second large offshore development project of TNSW concerns the offshore service submersible (OSS). Noting that the conveying of oil and gas has shifted to increasingly deeper waters and sites with worsening environmental conditions, the TNSW management expects a market to develop for high technology equipment for oil extraction. This is why it decided to develop the offshore service submersible as part of an underwater oilfield exploitation and oil extraction system. This submarine is suitable for a number of tasks like transport, inspection, repair and maintenance. A Norwegian firm, with a project similar to the OSS, is developing key technologies for underwater work. TNSW is participating in this development of a system for diverless installation, inspection, service, maintenance and repair, called "super sea", for carrying out work on the seabed connected with oil and gas production. The Emden company is to develop a submarine for this project, subsidised by grants from the EUREKA research programme.

TNSW's business activities have been extended since the mid-1970s to include the servicing of military vehicles and equipment. Airfield refuelling lorries in particular, are serviced and repaired. The management recently decided to create a manufacturing plant for the production of synthetic materials. The know-how concerning materials gained in the construction of naval submarines is expected to be transferable to civilian purposes, e.g. for building jetties. Over and above these structured diversification activities, TNSW has carried out a number of different single orders at its yard, in the 1980s. A crane jib and a filling bogie of giant size for a coking plant were built. A bio-drum (biological container) for a compostation plant and a filtration plant for waterworks were manufactured. The yard was also involved in the construction of large oil tanks in the harbour of Emden. The existing cranes and other equipment at TNSW were appropriate for fulfilling these orders.

The management team is continuously on the look-out for new products. However, according to a representative of the yard, the Emden enterprise is restricted in its diversification attempts because only those products can be selected which are not already produced, or intended to be produced, by other Thyssen subsidiaries. Production can be started only after co-ordination within the corporate management. On the other hand, the TNSW yard has greater financial resources to fall back on and can more easily cope with initial losses of new product lines, than smaller firms not bound to the Thyssen

network. This is no small advantage, as there are competitors with specialised know-how in nearly all areas of production and, in order to be successful, financial leeway is necessary from the outset.

Let us now examine the impact of TNSW's restructuring on employment. The fall in the demand for ships resulted in a reduction in the number of yearly manufacturing work-hours at TNSW from 5.3 million, in the early 1970s, to 1.6 million today. Since the loss of contracts could not be compensated by other activities, the number of employees was reduced step by step. Today the Emden yard employs less than 2,000 workers, about one-third of the number employed there at the beginning of the 1970s. The yard already had a highly qualified workforce in the early 1970s, with 73 per cent of employees having completed vocational education and training. This percentage has since increased.

The cuts in personnel were organised in various ways: early retirement schemes; not filling positions that had become vacant; not employing apprentices and trainees after their training had been completed; and, of course, redundancies, backed up by social compensation programmes. The reduction of personnel was by and large carried out in agreement with the trade unions and the works council. One consequence of the rationalisation and adjustment measures was that the structure of the labour force in the yard changed. The average age increased from 37 years in the mid-1970s, to 44 years in 1988, which might cause problems for the acquisition of new skills. So far, however, the company has noticed no difficulties in this respect. Innovations such as computer technology were introduced without friction, both in production activities and in offices. A Thyssen-owned training centre in southern Germany is available for seminars and training courses, in which Emden employees frequently take part.

As the new fields of activity were closely linked to the earlier activities, changes in the skill composition of the workforce were seldom necessary in the preparation for new tasks. Some retraining measures were conducted satisfactorily, when necessary, in co-operation with the local labour exchange office. Of course, TNSW is in a special position due to its status within the Thyssen corporation. When, for example, a whole class of apprentices could not be employed later at the yard, the corporation offered the apprentices jobs in another Thyssen subsidiary making machine tools in southern Germany. Given the orders on hand, as well as the international standing of the corporation, the jobs with the south German subsidiary could be regarded as secure. Some of the young workers accepted these job offers and moved into a Thyssen-owned residential complex in south Germany, in the vicinity of the newly established firm. But considerable social problems arose, which caused the majority of the young workers to return to East Frisia. There, as a rule, they remained unemployed, which illustrates the problems of labour mobility even in seemingly favourable circumstances.

4.4 Howaldtswerke-Deutsche Werft AG, Hamburg/Kiel

After negotiations lasting for many years, Howaldtswerke-Deutsche Werft AG (HDW) was established at the beginning of the 1970s through the merger of two yards, at the instigation of the federal Government. The erstwhile private owners withdrew their participation, while the government of the state of Schleswig-Holstein took a 25.1 per cent shareholding in HDW, in 1972. Although the state participation was supposed to be short-term, the government of Schleswig-Holstein still partly owns the company today. The main shareholder of the yard is the federal government-owned steel corporation Salzgitter AG.

At the time of the merger, HDW was the largest shipyard in Europe with more than 20,000 employees. It was also one of the biggest shipbuilding enterprises in the world. However, in order to be able to meet future challenges in the shipbuilding industry, productivity had to be increased. A reorganisation was carried out, after which the corporation had five plants in Kiel and in Hamburg. Employment was reduced to 14,700 workers by 1975. Despite further reductions in the number of workers, HDW continued to be the biggest yard in the Federal Republic of Germany for a decade.

The merger was accompanied by a concentration of the different production activities: ship repair, maintenance and offshore technology, as well as construction of special vessels, were concentrated at two facilities in Hamburg. Building of new submarines continued at a plant in Kiel. At another yard in Kiel (Gaarden) large vessels were built of up to 240,000 dwt, like oil tankers, gas tankers and large cargo container vessels.

In September 1973, the generally optimistic mood and the investments of other West German competitors led the HDW board to build a dock for large tankers of up to 700,000 dwt in Kiel-Gaarden. Site advantages, as well as the influence of the state government of Schleswig-Holstein, coupled with higher subsidies, led the Kiel yard to be chosen rather than Hamburg. This decision, however, made it inevitable that in the case of a crisis in the merchant marine section of shipbuilding, the Kiel region would be affected. The decision for the greatest investment in the history of the yard was made just before the oil price began to soar. The construction of the dock was carried out, in spite of the fact that some orders were converted or cancelled.

The financial situation of HDW had been excellent in the mid-1970s. Retained profits, a capital investment of DM50 million by the owner in 1975, and reserves added up to DM500 million at the end of 1976. Instead of using the financial means for a long-term restructuring programme, the management of HDW relied on optimistic forecasts on the future expansion of the shipbuilding market and tried to bridge the crisis with loss-making orders. The savings were used to offer financing schemes to customers which were more attractive than those of the competitors. In that way it was possible to stabilise employment, but most of the orders did not cover costs. The savings dwindled away rapidly.

In September 1978, the management of HDW presented a restructuring project to deal with the crisis. Production was to be concentrated at only three facilities and although the number of employees had already been reduced from 14,700 in 1975 to less than 13,000 in 1978, a further 2,000 workers were to be laid off in the next three years. One thousand and five hundred workers were to be dismissed in Hamburg.

The core part of the management plan was to stop the construction of vessels in Hamburg. This measure was prevented by the Hamburg governmental member of the board. (Representatives of the workforce and the union were represented in the board of HDW according to the law of co-determination. Together with one member from the capital site, a governmental representative of Hamburg, they had a majority in the board.) He and the shop stewards pushed through the continued building of new vessels in Hamburg. The number of employees was to be reduced by only 700. Instead, diversification efforts were to be strengthened. For that agreement the government of Hamburg was prepared to pay more subsidies. The plan failed, for a number of reasons. Firstly, the watering-down of the management project resulted in an insufficient restructuring of HDW to match the changes in the shipbuilding market. Secondly, the required diversification was more difficult than the majority of the board had expected. Diversification efforts were concentrated on the highly competitive ship repair and maintenance market and gradually on

offshore and engineering.[26] While the construction of vessels, ship repair and maintenance remained loss-making propositions, offshore and engineering were financially successful. However, from time to time HDW "bloodied its nose" in these production fields as well.[27] For instance, the management incurred financial losses in the construction of a smoke desulphurisation system in Hamburg, when it failed to negotiate liability guarantees with the owner of the faulty technology.

In the early 1980s, HDW-Hamburg was very successful in getting a foothold in offshore technology. It earned a reputation among the large oil companies as a supplier of high-quality, good price equipment, who kept deadlines. But at the end of 1982, HDW expected a DM70 million order for the superstructure of an oil rig in a Norwegian oilfield, since the oil corporations concerned had expressed direct preference for HDW, in view of its prices, quality and timely delivery.[28] But the Norwegian Government intervened and gave the order to a Norwegian yard instead. The loss of this order represented a significant turning-point for HDW.

After that the crisis continued, due, among others, to management errors. In 1983, the management decided to stop all building of new vessels in Hamburg. Mass redundancies were announced and ultimately carried out. Over 3,500 yard workers were dismissed. This included more than 2,000 of the total 4,000 in Hamburg and almost 1,500 of the total 6,400 in Kiel.[29] The result was massive unrest among employees and the population of the two cities, including public debates, discussions, demonstrations and finally the workers' occupation of the yard in Hamburg. The HDW management reacted, among others, by making the facility in Hamburg an independent company, which was soon sold to Blohm und Voss.[30] The Kiel plant remained a subsidiary of the Salzgitter corporation.

From now on, the measures for the consolidation of the remains of HDW were concentrated on the Gaarden yard in Kiel. Investments were made in the creation of a modern submarine assembly plant and the construction of a central administrative building for the technical and commercial divisions. In September of 1988, there were about 4,600 employees left at the Kiel yard. Approximately half of the turnover has been achieved by military contracts. Up to now, the civilian sector of new vessel construction has been maintained, even though considerable losses are still being incurred.

Diversification efforts started as late as the end of 1977, i.e. more than three years after the collapse of the tanker market. The managing director instructed the main research and development department to evaluate HDW's technological basis for the development of new products, and their market prospects. But only projects close to construction and shipbuilding problems had a chance to receive adequate engineering and marketing support. The most successful diversification attempts of HDW took place in or around Kiel; they concerned Hagenuk and Salzgitter Elektronik. HDW took over Hagenuk in March 1979, with 1,250 employees and a turnover of about DM100 million. Hagenuk produces precision engineering products and electronic equipment. The company is a leading manufacturer of cordless telephones.[31] In 1988, it had 1,860 employees and a turnover of DM200 million.[32]

The second diversification success of HDW concerned the setting up of HDW Elektronik GmbH in Kiel, by separating the division of ship automation and cable measuring technology from the yard. In the first year of its separate existence (1983) the new company achieved 10-15 per cent of its turnover by dealing with HDW, while 60 per cent of turnover were exports. Employment started to rise rapidly and new facilities had to be built in the Kiel region. Production was extended to include new types of products in the field of marine and environmental technology and of system engineering. Investments

of DM120 million were made for these extensions. The investment outlays were partly financed by the state of Schleswig-Holstein which became a shareholder with a 25.1 per cent stake in the new company. The remaining stock, as in the case of HDW, is held by the federal government-owned steel corporation Salzgitter.[33]

4.5 Early and successful diversification: Blohm und Voss

Blohm und Voss did not enter the market for tanker production in the early 1970s although some plans had been prepared for it and preliminary contracts had even been signed. Contrary to other large West German yards, the Hamburg company chose to build up other production lines. It worked out a diversified production programme which enabled it to get through the shipbuilding crisis with fewer losses than most other West German shipyards. Until the middle of the eighties, Blohm und Voss - chiefly owned by the Thyssen Industrie AG - was making profits. The favourable business situation was largely due to the diversification of production, reaching beyond the traditional shipyard programmes. In 1986, Blohm und Voss bought the former Howaldtswerke-Deutsche Werft (HDW) factory, now called Ross Industrie GmbH, in Hamburg. The reasons for the take-over seemed to be influenced by political considerations. Indeed, at the end of 1985, Blohm und Voss acquired an order for three frigates for export to Portugal. The deal was to be subsidised by the federal Government to the extent of DM400 million. It was rumoured at the time that the federal Government had taken advantage of the situation and shifted the HDW industrial relations problems (a plant occupation by workers in 1983, etc.) to the privately owned Blohm und Voss. After a thorough examination of HDW's situation and possibilities, the Blohm und Voss management decided to give up the site of the HDW plant and to concentrate all activities at Hamburg-Steinwerder headquarters. In the wake of the integration process the production programme was divided into three parts: construction of vessels (mainly military shipbuilding, with the introduction of luxury yacht production in 1985); ship repair and maintenance; and machine building. About 75 per cent of the Blohm und Voss production is exported.

The diversification strategy of Blohm und Voss is summarised in table 8. Blohm und Voss diversified into the offshore market at the beginning of the 1970s, before the first oil crisis. The company first produced the offshore equipment under licence and later developed its own products. The offshore programme was expanded during the 1970s. Blohm und Voss joined several international offshore consortia. However, falling demand and increased protectionism of the two big oil-producing countries in the North Sea, the United Kingdom and Norway, soon made the offshore business more difficult.

Until the mid-1970s, Blohm and Voss mainly constructed container ships. The falling demand and shrinking profit margins led first to a reduction and then to the complete stop of commercial ship construction. In its place, production of a special type of frigate (Meko) was started. In 1985, after the take-over of HDW, the manufacturing of luxury yachts was taken up again. The company had already built some during the 1950s, but as demand started to grow for larger and more profitable types of ships, the production of yachts was discontinued.

Table 8. Principal measures taken by the Blohm and Voss company during the shipbuilding crisis

Year (until)	GNP in OECD countries	World ship-building	World ship-building (mio.grt)	Decisions taken by Blohm and Voss management
	(Percentage rates of change)			
1973	6.1	13.4	30.4	Due to balanced situation in all areas of production, no build-up of tanker production capacities, but introduction of new production line: offshore technology.
1975	-0.3	2.1	34.2	Production of vessels only under conditions of guaranteed profitability; intensification of offshore equipment production; expansion of repair and mechanical engineering activities.
1977	3.8	-18.6	27.6	Production of six container ships and two bulk carriers, further vessel orders uncertain; intensification of repair of large vessels; construction of a new floating dock; production of rigs, pipelay - and crane barges; naval field: development of a special type of frigate.
1980	1.2	-8.4	13.1	No construction of new civilian vessels; expansion of offshore technology production (e.g. modules for offshore production and accommodation platforms); extension of test and measurement section.
1983	2.4	-6.5	15.7	Delivery of frigates; construction of heating plants; development of industrial robots for heavy duty tasks; intensified engineering of offshore technology; co-operation in offshore consortia.
1986-88	3.7	-27.4	12.2	Acquisition of HDW-Hamburg; construction of a new engineering plant to improve competitiveness, problems in the offshore area; "further vocational training instead of dismissals".

Source: Klaus Nürnberg, "Probleme der strukturellen Anpassung in der Werftindustrie", in: Die Betriebswirtschaft, 45.Jg (1985), p. 640, own supplements.

In the mid-1970s Blohm and Voss intensified its ship repair activities. A new floating dock was built for repairing large vessels. After the HDW take-over, Blohm and Voss became in 1986 the only supplier of repair and maintenance services in the Hamburg harbour.

Blohm and Voss also successfully diversified into the engineering sector. It now operates the largest mechanical engineering plant in north-west Germany, into which about DM50 million have been invested. These investments came from company reserves, government subsidies and from funds made available by the present company, Thyssen Industrie. Employment in the engineering plant has been growing. The company has plans to employ 1,230 workers there.[34] The engineering programme of Blohm and Voss can be divided into three approximately equal sections: energy and environmental technology, production technology, and shipbuilding projects.

After the take-over of "Ross", the personnel, the development department and the know-how of the newly acquired firm represented an enrichment for Blohm and Voss, in spite of the fact that this required certain changes in company policy and company organisation. In addition to the modification of its activities, Blohm and Voss modified also the organisational structure of the yard. Until approximately 1970, Blohm and Voss had a "functional organisation". Since then, the company has been reorganised into "profit centres". This meant that the responsibility for any one product or group of products was given to a small "centre", starting with design and development, followed by manufacturing, and ending up with marketing. The restructuring was accompanied by the introduction of computer systems for different tasks (planning, control, CAD, etc.). As a result of the integration of "Ross", thousands of smaller orders had to be processed in addition to large ones. For this reason, new sales departments and new design/construction/development departments have been created.

The restructuring process and the switch to new products had far-reaching consequences for the workforce. Its structure was modified and the level of qualification increased. In 1988 as much as one-third of all Blohm and Voss employees were technicians and white-collar workers of various occupations. The company has dismissed workers with low or insufficient qualifications who could not undergo further training. Specialised knowledge ranging over a fairly wide field is essential for Blohm and Voss employees. The possibility to shift personnel easily and rapidly between the three production sections of the company - engineering, shipbuilding and repairs - increases productivity and permits a relatively high level of remuneration.

The company tried to manage the employment cuts by adopting a number of measures. Compensation and early retirement were offered to older employees and the company took an active part in government-sponsored schemes for training and employment conservation. In spite of the early retirement scheme, the average age of the workers increased as young workers were no longer hired. The changes led to a scarcity of training personnel and of qualified workers. The company now finds it difficult to fill engineering vacancies. Due to the image of shipbuilding as a sunset industry, it is not easy for the enterprise to recruit qualified personnel. Regional labour mobility has been low. It seems, for example, practically impossible to recruit engineers from the south of Germany to work in Hamburg. Since the experience of the early 1980s showed that new people brought in new ideas, a special effort of public relations has been undertaken, in order to change the image of the company not as being pulled down by a declining sector but as having gained a new dynamism.

In the summer of 1986, the shipbuilding crisis in West Germany intensified. The dismissal of 1,500 Blohm and Voss workers in Hamburg became imminent. In the face of this situation, the local government set up a programme of special measures. Blohm and Voss was a corner-stone in this programme. The yard managers, the work councils and the unions and employers' associations co-operated in this venture. The programme comprised subsidies for the local yards and assistance for workers threatened by dismissal. It also called for job creation in other branches. The total cost of this programme was DM90 million, for the years 1988 and 1989. The main points of the programme were:[35] (i) support for new technologies in order to modernise the economy of Hamburg and improve the companies' competitiveness; (ii) preparation of projects to promote the creation of new firms; (iii) diversification of the shipbuilding industry in Hamburg through the establishment of a diversification fund; (iv) improved training and retraining of workers.

The main training scheme was called "Further vocational training instead of dismissals"[36] and was chiefly aimed at increasing the supply of skilled workers required for the new ventures resulting from diversification efforts. In addition, it relieved the yards of a considerable share of labour costs during the diversification process. The Federal Labour Office and the Hamburg local government financed the vocational training courses and contributed largely to the income of the trainees. At the end of the training courses, the yard could assign them to new jobs without having to look for qualified manpower on the labour market. The local government had to pay the difference between the training allowance and the lower net wage. Holiday arrangements and other social advantages were honoured.

According to West German law, the Government cannot support global training measures for the employees of a company or branch in difficulty. Because of this, special agreements had to be concluded between the managements of the four main yards, the work councils and the labour office in Hamburg.

Although the scheme looked fairly attractive, many workers were reluctant to join the training courses. This was due to the fact that, in order to make workers eligible for training, the management had to name them, and declare them threatened by dismissal. Appearing on such a "danger list", however, marked the workers with the stigma of being already unemployed. But because of the support of the works councils for the scheme, a considerable number of workers ended by taking advantage of it. Until March 1988, the labour office organised training for about 500 employees. Table 9 shows the number and the age structure of the workers of Blohm and Voss who participated in training courses in 1988.

Over half of the employees willing to participate in job-oriented, additional training were under 30 years of age and only 25 per cent over 40. Since the average age of workers at the company is 43, obviously the interest in training causes was much higher among the younger workers than among older ones. Most dismissed workers over 55 took advantage of the early retirement scheme. If older workers did participate in retraining, they took mainly short-term courses. About half of the workers over 40 attended courses lasting three months at the most. It is not clear yet whether the training measures will generally result in delayed dismissals or lead to greater job security. However, one thing has already been achieved: contrary to the large job reductions in other areas, such as Schleswig-Holstein, the mass dismissals from the yards that had been feared have not occurred in Hamburg. The personnel cuts could be kept on a level roughly corresponding to normal job fluctuations.

Table 9. Number and age structure of workers of the Blohm and Voss shipyard participating in training schemes, 1988

	Numbers	Percentage distribution
Under 26 years	107	28.3
26-30 years	109	28.8
31-40 years	66	17.5
41-50 years	69	18.3
Over 50 years	20	5.3
Not known	7	1.8
Total	378	100.0

Source: Siegfried Bergner, "Qualifizieren statt Entlassen". Zum Stand der Qualifizierungsmassnahmen im Rahmen des Hamburger Aktionsprogramms Wirtschaft, 2 May 1988, p.2. Own calculations.

Industrial diversification has been supported by trade unions in general and by trade union representatives at Blohm and Voss, in particular. Manufacturing new products was seen as having a stabilising effect on employment. Trade union representatives recognised that training and retraining were very important in the diversification strategy. As a result, they supported the training programmes and gave active support to the scheme "Further vocational training instead of dismissals". They were actively involved in setting up the Committee on Alternative Production. The unstable employment situation was the chief reason why trade union representatives founded a committee in 1988 called "Committee on Alternative Production" ("Arbeitskreis Alternative Fertigung"). The immediate cause for this action was the situation at the HDW yard in Kiel. In the face of threatening unemployment, HDW personnel demonstrated to make the Federal Government agree to the exports of naval submarines to developing countries, including Chile. Since Blohm and Voss was also exporting military vessels to developing countries, it was feared that the employees in Hamburg might voice the same demands. It became urgent for the unions, therefore, to show that "alternative production" was possible and desirable and to promote as much as possible this line of policy. The Metalworkers' Union, which is the largest in the Federal Republic of Germany, adopted this stand at an early stage.

The programme of the Committee on Alternative Production included the following main points:[37]

- reduction of the yards' dependence on armaments' production as a medium-term programme;
- job protection;
- search for socially useful products;
- providing evidence that other products could be made by Blohm and Voss;
- improving the possibilities for change in the product mix and broadening workers' participation.

First, the committee collected ideas from employees about what could be produced by the company. However, the organisers soon recognised that this did not have a sufficiently mobilising effect on the workforce. The committee wanted to encourage employees to fight for their jobs and to extend worker participation. But many workers saw the "Committee on Alternative Production" as only another research and development unit, in addition to the one already in existence. Therefore, the members of the committee decided to concentrate their efforts on a few selected products. Two subgroups were formed, one dealing with shipbuilding and the other with mechanical engineering. The shipbuilding team put forward two projects for reducing the energy requirements of ship engines. The mechanical engineering team concentrated its efforts on other energy-saving technologies. This team developed a project for energy supply in Hamburg, using local heating plants. In the early 1980s there was an intense public debate on the possible ways of substituting nuclear energy. The committee took an active part in this discussion, promoting its energy-saving projects. The underlying idea was that if the local government in Hamburg agreed to the proposals, Blohm and Voss could sell turbines, boilers and related products, which had already been produced at the yard in the past. The personnel of Blohm and Voss discussed the energy project, too.

The management turned down the proposals of the committee, pointing out that:[38]

- markets were too small even if production was technically feasible;
- management had already examined all possibilities concerning the proposed products and found that there was no demand for them;
- the proposed products could not be integrated into the production programme of Blohm and Voss;
- the management had other diversification plans.

The management feared partly that the discussions on new products could be interpreted as an expansion of workers' participation in the company. In spite of this, the "Committee on Alternative Production" tried to keep discussions with the management going. It achieved management's agreement to sponsor the further development of one of the proposed products (Wagner-Rotor) allocating DM15,000 to it. The sum was relatively modest, but it meant the first visible success for the committee.

Only about 20 persons took an active part in the work of the committee. The reasons for the limited involvement of employees were that there was real hope for a peaceful settlement of the conflict between the management and the union and a wide awareness of the difficult world market conditions. Thus, the adoption of the alternative production project was a rather distant thought for many. In addition, the technical nature of the discussions seemed to put off many employees, preventing broader support from them.

4.6 Attempts to safeguard jobs through new forms of labour policy: Ross Industrie GmbH

Ross Industrie is a subsidiary of Blohm and Voss. When Blohm and Voss took it over in 1986, there was considerable overlapping in the activities of the two companies. Reductions in personnel were therefore inevitable. As a first step, the Blohm and Voss management reduced the number of clerical workers. Then the machinery and equipment of Ross were gradually transferred

to Blohm and Voss in Hamburg-Steinwerder. By the end of 1988 the Ross factory was closed.

At the beginning of 1988, about 1,300 workers were employed at Ross. Some 950 of them were offered jobs at the headquarters in Steinwerder, but with a cut in salaries and fringe benefits. Because of these pay conditions a number of employees gave notice and looked for new jobs elsewhere.

About one-quarter of the workforce (254 production workers and 64 clerical workers) was dismissed without offer of re-employment. All the production workers concerned had been employed in the ship repair area. The workers affected could choose to leave the company with financial compensation or to accept a short-term employment contract and undergo training for up to two years. If after the training course the workers could not be re-employed by Blohm and Voss an option open to them would be to join an "employment company" (Beschäffigungsgesellschaft).

The "employment company" represents a new form of government employment policy. It is a registered, non-profit-making organisation with board members from the local government, the local trade unions and management. In March 1988, such a company was founded for former Ross workers under the name of "Öko-tech". The Government put a site at Öko-tech's disposal, while buildings and equipment came from Blohm and Voss. The company is expected to employ 100 workers. Most of them are to be paid by the Federal Labour Office on the basis of ABM or "work-creation-programmes". The revised version of the Employment Promotion Act of January 1988 makes it possible to subsidise employment of persons aged 50 or over for up to eight years. This means that older workers can now avoid unemployment if they take early retirement after having worked at Öko-tech.

The activities of Öko-tech consist of:

- preparation of plans for experimental productions and prototypes manufacturing in the field of maritime technology;
- research and development in the fields of environment, waste disposal and energy problems;
- implementation of infrastructure programmes;
- technical, organisational and economic consulting to regional employment initiatives.

As in the case of the training schemes, it is still too early to evaluate the success of Öko-tech. It should be stressed that only a small group of employees accepted the training and re-employment offer. Not all workers who were in a position to do so joined Öko-tech. Many former employees preferred the risks of the labour market to employment in Öko-tech until retirement. There are many reasons for it. One of them may be that the fierce public discussion and the uncertain future of Öko-tech gave the "employment company" a negative image.

5. Summary remarks on the restructuring processes in the West German shipbuilding industry

After an exceptional upswing in demand in the early 1970s that led to a considerable extension of production capacity, the worst crisis ever soon hit the West German shipbuilding industry. The yards were not prepared for the fall in demand. There were almost no plans for production restructuring.

Therefore, the initial reaction to the crisis was a cut in employment to match the decrease in demand. Early retirement schemes, non-employment of apprentices and trainees after completion of their training, short-time work and redundancy, mostly helped by social programmes, were the solutions resorted to by employers and finally accepted by trade union representatives. These measures were based on experience of earlier recession periods when reductions in the number of personnel preceded business stabilisation. The adjustment measures were meant to make the enterprises more competitive in the upswing that was believed to follow. This time, however, the crisis proved to be structural. Trade union representatives, yard managements and state governments agreed on a common stand for overcoming the situation. They all wished the federal Government to intervene and to step up financial aid. Programmes aimed at improving the production structure, run by states, were supposed to complete the restructuring and diversification measures. The federal Government was asked to expand its support programme to the shipbuilding industry, started in the 1960s and continued in the 1970s, in order to meet the demands of the so-called "strange coalition". This programme consisted of financial support for the buyers of vessels, direct grants to yards, the financing of research and development and the granting of federal contracts for naval ships and military equipment. The laws on the export of weapons were relaxed. The shipyards also benefited from subsidies granted by the state governments of the four coastal states affected. As the customers, i.e. the shipping companies, paid most of the costs of the ships, the federal and state governments achieved a relatively high employment effect by paying only a small part of the total cost. Support of shipbuilding production was less costly for the public authorities than the various alternatives, particularly than an increase in unemployment and in unemployment benefits.

In the first years of the crisis, the long-term plans of the shipbuilding companies included only marginal diversification projects as most companies expected the crisis to pass and demand for ships to pick up again. When it was finally realised in the early 1980s that the crisis was of a structural character, serious discussion started on the means of reducing production capacities, and efforts were made to broaden the scope of production programmes. These efforts were not always successful, and some yards had to be closed.

The diversification and conversion efforts cannot be finally evaluated yet. Our survey of the experiences of the large West German yards during the shipbuilding crisis has revealed, however, that the diversification efforts of the companies have remained modest. Non-shipbuilding production has reached only about 10 per cent of the total. Those companies that started to diversify their production at the early stages of the crisis fared considerably better than those clinging to shipbuilding.

5.1 Diversification and conversion experience in West German shipbuilding

Almost all yards based their diversification efforts on existing expertise in engineering, often acquired over more than a century. This knowledge has been used as the point of departure by the shipbuilding enterprises which tried to establish themselves on the market for engineering products. The yard equipment could often only be used for single-piece manufacturing of customised items similar to vessels. In general, both factory halls and machines had to be either bought or newly constructed for the new production lines. The original shipbuilding plants were essentially only good for shipbuilding. In the case of diversification to a new area of

production, it was generally simpler to build a new factory on a nearby vacant site.

Among the enterprises analysed above, only Blohm and Voss has by and large succeeded in a partial conversion to non-shipbuilding production. This was due to the fact that the company did not switch to supertanker construction in the 1970s and its financial resources were not committed in this fruitless venture. Even more important was its willingness to introduce restructuring measures at an early stage. Apart from the management's foresightedness and the company's flexibility and ability for restructuring, there was also a considerable amount of luck that permitted this achievement.

Although the offshore sphere is closely tied to shipbuilding, this sector can be regarded as the most notable success in conversion at Blohm and Voss. Initially, the company manufactured offshore technology under licence; after about five years, it was able to successfully market its own products. This example demonstrates, among others, the considerable amount of time that the development of a technologically demanding product can require. It also illustrates the instability of markets: without the oil crisis, oil production in the North Sea would not have become economically viable. The factors explaining Blohm and Voss's successful conversion to offshore technology manufacturing include the availability of all the required skills among its workforce. They also include an adequate engineering capacity. Finally, they include an appropriate management control system. But even when a company has established a reputation for itself concerning quality, timely delivery and cost, it remains in competition with other firms. It can lose orders, as the example of HDW-Hamburg demonstrates, with possibly disastrous consequences for employees and for the whole enterprise.

In the engineering field, system solutions are increasingly in demand. Given the level of specialisation in advanced market economy countries, enterprises must reckon with long market introduction phases. Currently, pay-off periods of seven years are the average. Considerable financial resources are needed during this period to offset losses. All firms interviewed were therefore glad to be part of large corporations or to receive support from state government that had the means to finance such loss-making activities over the required time during the restructuring processes.

Hagenuk GmbH in Kiel, which was taken over by HDW in 1979, can be quoted as a second successful example of diversification and conversion. Using its capacities and the skills of its workforce, the company was able to expand employment by one-third within a decade and to secure a good position in the telecommunications market. The failures experienced by some of the other companies show that there are no ready-made solutions to the problems of diversification. Decisions must be based on a detailed knowledge of the market for the products concerned and made on a case-by-case basis.

5.2 Enterprise characteristics and their relevance to the capacity for adjustment

The problems arising from production restructuring and conversion seem to be independent of company size. More important is the company's ownership structure and its affiliation to a large corporation. Although a subsidiary company might be limited in its diversification decisions by the parent company, which would consider first the production programmes of all its subsidiaries, and the interest of the group as a whole, companies without sufficient financial backing, especially small- and medium-sized independent firms, tend to have a hard struggle with the conversion to new products. For the yards, the double task of remaining competitive in shipbuilding and, at

the same time, getting a foothold in new markets often exceeded their financial possibilities and this is probably the major reason of their limited non-shipbuilding production.

Many West German shipbuilding companies were quite successful in overcoming the crisis by specialisation within shipbuilding, and by establishing themselves as leaders in their narrow field of specialisation. But considerable financial and research resources have been thus tied up. Product diversification in order to spread risks better has rarely taken place. This indicates that it is generally easier and more promising to start manufacturing new products and create new employment opportunities after breaking with "traditional" production. This seems to hold both for companies that have remained profitable in shipbuilding - here the incentive to diversify was low and the investment requirements in the "traditional" area were high - and those trying to remain in shipbuilding despite losses - here the financial means were lacking. The double task of remaining in the "traditional" market under crisis conditions, and at the same time of carrying through a restructuring process, has proven too demanding for most managements and financially too ambitious for the enterprises. It may be noticed that, in general, the short-term profit orientation and the fear of making incorrect decisions led to a considerable inflexibility on behalf of the yard managers. They were not prepared to take short-term risks. Instead they hoped for a revival of the shipbuilding market and accepted the prospect of liquidation if the upswing did not come about, rather than taking long-term diversification measures. The extreme example of this has been the management of AG Weser-Gröpelingen that shut down its research and development department, in order to reduce costs at the beginning of the crisis, thereby ultimately binding itself to a revival of the shipbuilding market or going bankrupt. In the face of the conservative reactions of company managements, it may be asked whether a change in management might not be sometimes necessary before the launching of a restructuring process. An important condition for the success of diversification and conversion has been the availability of a highly qualified workforce and a good research and development department. This may be summarised as flexibility on a high technological level, since conversion is most likely to succeed if high technology products can be supplied to newly expanding markets.

5.3 Restructuring and employment

Diversification and conversion efforts require a change, mostly an increase, in the average level of qualifications of the workforce. While engineers and technicians usually have little difficulty adjusting to new production conditions, and their services become vital to the company, unskilled workers often become redundant. If new employees are hired they mostly belong to the category of technicians, whose share in total employment normally goes up. Skilled manual workers end up by increasing their qualifications due to the widened range of items produced and to the shifting of working posts. This pattern has been noticed particularly at Blohm and Voss, but also at other yards. Everywhere problems associated with training programmes and with the introduction of new technology have been generally solved relatively rapidly.

Because of the importance of qualified personnel for the success of diversification and conversion measures, training and retraining problems have been given considerable attention in restructuring strategies. Government authorities have offered to finance retraining courses. A new scheme combining diversification and conversion with training and retraining is being tested in Hamburg, where employees, threatened by dismissal, have been offered training and retraining courses in order to qualify for more demanding jobs

inside or outside the company. An intensifying feature of the Hamburg programme has been that younger workers were as a rule more willing to participate in long retraining courses. Older workers, on the other hand, if they were ready to participate in retraining courses, generally chose shorter ones, presumably thinking that their chances of keeping or getting a job after retraining were limited. A similar pattern could be noticed also for minority groups such as foreign workers or handicapped workers. These workers have had difficulties in retraining and in improving their skills, and an analysis of the situation on the Bremen labour market has shown that they tended to be crowded out from companies that, in the process of restructuring, hired skilled workers while getting rid of "problem" workers. Retraining programmes have a negative secondary effect: while raising the qualification level of some workers, they make the others appear relatively less qualified.

Since only a very small proportion of the workforce made redundant during the shipbuilding crisis had been employed in new jobs created through diversification measures, many became unemployed and the burden of their unemployment fell on the regional labour markets. The local labour markets, even in fairly depressed areas, were able to cope with large redundancies and most workers have been able to find new employment. But, the relatively well-qualified shipbuilding workers crowded out others. The pool of problem workers increased. Many of these workers decided to leave the labour market either through early retirement or by migrating to their home countries; or by going on social security. Another possibility for the workers who lost their jobs in the north German shipyards would have been migrating to the more prosperous south. But labour mobility within West Germany proved to be particularly low. As mentioned earlier, east Frisian workers who were offered employment by Thyssen in another corporation-owned establishment in southern Germany preferred to remain unemployed at home. Similarly, it proved difficult to attract engineers from southern Germany to move to Hamburg. The labour market in the Federal Republic of Germany is highly regionalised, in spite of the fact that several million change jobs each year. Thus, employment policy in the Federal Republic of Germany is largely a regional or state issue.

5.4 The role of trade unions in the restructuring process

The trade unions, i.e. IG Metall, demanded the restructuring of the industry and the adoption of new product lines at the yards and in the regions fairly early on in the crisis. They were asking for extensive planning and for public support for the creation of new jobs in alternative fields. When from time to time different short-term solutions were supported, they resulted from specific circumstances and did not mean that the unions wanted to give up the diversification policies. The unions always supported education and training measures for apprentices and retraining schemes for older workers.

During the initial phase of the crisis, trade union representatives demonstrated relatively little resistance to personnel cuts, early retirement schemes, short-time work, or voluntary retirement from the yards. This attitude of the unions has to be seen against the background of the considerably lower unemployment rates and better economic conditions at the time. Only when unemployment rates started to get really high in the 1980s did confrontations with the management appear. Dismissals were followed by massive protests, which were more or less effective considering the difficult circumstances. The "Committee on Alternative Production" was founded at Blohm and Voss. The task of this committee was to protect jobs, to search for socially useful alternative products, to broaden workers' participation and to strive for the reduction of the yard's dependence on arms production. Even though none of the products suggested by the committee has so far started to

be manufactured, these activities have put a considerable pressure on the management to prepare restructuring and conversion plans. To many outside observers the large investments in the engineering division of Blohm and Voss seemed related to the activities, discussions and struggle of the Committee on Alternative Production.

Training and retraining measures in shipbuilding have been positively received by the trade unions, and have been considered as an important step for increasing competitiveness and for making diversification possible. The retraining programme in Hamburg called "Further vocational training instead of dismissal" is generally regarded as a positive result of union pressure for the association of training with diversification measures. The training programme was accepted at the yards largely through the massive support and assistance of the shop-floor union representatives.

5.5 The role of government policy in planning and assisting the process of industrial conversion

In the Federal Republic of Germany subsidies are not directed at individual enterprises as a rule. Instead, support programmes are designed for industrial branches, or regions. The system of government intervention is dominated by indirect incentives. The shipbuilding industry benefited from a number of support programmes from state and federal governments to help it along and make it switch to new fields of production. The companies made large use of government support in their restructuring efforts. Although state governments tried to place public contracts within their state boundaries, they did not direct their assistance to the shipbuilding companies trying to diversify as such. State governments refused to eliminate competition for public contracts by helping only the ailing companies, or those undertaking restructuring measures, on practical and fundamental grounds. Although the employment problems of the ailing companies or those involved in restructuring could probably be mitigated by such an approach, this would at the same time lead to employment problems at other companies in the region. Moreover, the selective placing of orders leads to decreased competition in the long term. Finally, the preferential treatment of certain companies is contrary to the Common Market (EEC) law on free trade as well as to national regulations and budget rules.[39] In short, state institutions are only in the position to create similar conditions for all companies alike. Measures of direct government support, as successfully practised in the Swedish shipbuilding industry, were not undertaken in West Germany due to free enterprise principles.[40]

In spite of such declarations of principle, government intervention is practised almost daily. Many instances of state intervention can be found in the shipbuilding industry, for example at the Harmstorf, HDW-Kiel, Blohm and Voss and the Bremen yard combine. The measures can mostly be described as short-term assistance. The Bremen case, however, represents an attempt at finding a long-term solution to a difficult economic problem. The project consists, on the one hand, of assistance for the Bremen yard combine, to enable the enterprises associated in the "Bremen Werftenverbund" to maintain their shipbuilding and repair capacities as well as adopting new paths towards diversification. Furthermore, the state government has been trying to improve the regional and economic structure by supporting the introduction of promising new production lines. This support, aimed at helping shipbuilding companies and the regional economy, is, however, limited by the high level of government indebtedness.

But diversification and conversion measures are not always implemented, even when financial means are available. Federally owned Salzgitter AG and the state of Schleswig-Holstein allowed HDW, which they controlled, to use its considerable financial resources during the mid-1970s, not for restructuring, but to bridge the crisis with shipbuilding projects that did not cover costs. The participation taken by HDW in another yard in Schleswig-Holstein during the mid-1980s, can also be regarded as a state-directed attempt to utilise public funds for short-term crisis management under the pressure of rising unemployment.

Two particularly successful government-supported initiatives should be singled out: one was called "Further vocational training instead of dismissal" and the other was "Öko-tech", both backed by the senate of Hamburg. The additional costs for the training and retraining of employees were covered by the state of Hamburg, in order to raise the trainees' income and make the scheme more attractive to them. The establishment of "Oko-tech" meant the creation of an institution, taking care especially of the employment problems of older employees.

6. Lessons to be drawn for the conversion from military to civilian production

It may seem at first that the experiences and lessons learned from the crisis of the West German shipbuilding industry are not very relevant for the planning of defence industrial conversion, in the case of military procurement cuts. Few ideas and suggestions for detailed plans of a conversion process in the armaments industry can be derived from the above analysis of the West German shipbuilding crisis. However, a few general points can usefully be made:

1. During the shipbuilding crisis, the federal and state governments assisted the yards through subsidies, public contracts, etc., and supported the launching of diversification programmes. State-organised diversification did not occur in the West German shipbuilding industry, contrary to other countries such as Sweden, nor did the Government take over the yards. Thus, the legal and political framework of government assistance to conversion can take many different forms.

2. Considering the high rates of unemployment in the north German coastal states in comparison with the federal average, market forces alone cannot solve the employment problems caused by defence cuts. Local economic development proved too weak to absorb the unemployment caused by the decline in shipbuilding. It appears with hindsight that federally financed direct intervention to facilitate conversion might have had more effect than the indirect economic incentives. Thus, in the case of defence cuts of any importance the former should be given preference if unemployment were to be controlled.

3. Judging from the limited evidence of the successful diversification efforts in West German shipyards, strategies for defence industrial conversion should not be restricted to individual companies manufacturing military equipment. Conversion of armaments production with a minimum loss of jobs should be based on a strategy of strengthening and stabilising both the arms enterprises and the economy of the region. As it can be expected that more financial resources might be available for defence industrial conversion, once it became government policy, than for the restructuring of the shipbuilding industry, the chances for successful regional restructuring are, in theory, considerably better in the case of the former than of the latter.

4. The scope and success of government intervention might be limited by EEC laws and reglations preventing government subsidies. The adoption of a Common Market policy on defence industrial conversion would be necessary to define the scope and possibilities of government intervention.

5. The diversification experiences of the shipbuilding enterprises have shown that in view of the difficulties in entering high technology markets and competing with established producers this requires a long research and marketing preparation. Thus, early planning of conversion measures on all levels concerned would play a decisive role in any disarmament without (undue) job loss.

6. While conversion measures should take into account regional economic structures, the production capacities of arms-producing enterprises and the know-how and abilities of their workforce should not be ignored. Much would depend on an accurate evaluation of market prospects in the traditional spheres of production, as demonstrated by the experiences of the shipbuilding crisis.

7. The following conclusion can be drawn from the above points: the better the disarmament climate and the more improbable a reverse in the government disarmament policy, the more likely it would be that managers in arms production would try to switch to alternative production areas. The prospects to increase arms exports might create problems and jeopardise the conversion process. Appropriate political signals would have to be given by governments concerning weapon exports. Of course, arms control and disarmament treaties would be of great importance. For the defence industrial enterprises it would be particularly important that future levels of military budgets be announced and implemented, to help defence industrial enterprises plan conversion.

8. The awareness of permanently changed demand conditions would stimulate defence company managements to adopt more flexible attitudes and to take greater risks. Some managers in the largely politically influenced armaments industry who lacked flexibility, might be reluctant to enter into new markets whatever the situation. In such cases, initiatives by the employees for alternative production or to secure jobs in other activities might be very important.

9. It is difficult to evaluate exactly the effects of the "Committee on Alternative Production" at Blohm and Voss, but their activities seem to have stimulated the management. Employment was comparatively stable, diversification was given a certain priority and further education, training and retraining schemes were developed. These achievements were largely the results of "qualified pressure" from below.

10. The diversification experiences in the West German shipbuilding industry have the following characteristics:

- diversification attempts made use of technical skills available within the companies. Technical know-how was sometimes also acquired through the take-over of other companies;

- machinery and equipment utilised in shipbuilding could not be transferred to new areas of production except for custom manufacturing of single pieces;

- financial problems arose independently of company size, since companies tried to combine continued shipbuilding production and diversification into other manufacturing.

Arms conversion would be easier in the companies producing a wide range of output. It would be more difficult in firms which are highly dependent on arms contracts. In view of the long periods of research and development required for the launching of new products, and since experience shows that only few machines are transferable to new types of production, considerable financial support would be needed by producing companies if they were to convert to civilian production without too much job suppression.

Restructuring experiences in the shipbuilding industry have shown that the qualification levels of employees often did not match the new requirements. As a similar situation can be expected to occur in arms-producing enterprises, company managements, trade unions and government authorities should co-operate in the preparation of practical training and retraining programmes related as directly as possible to the future civilian production requirements. The retraining programmes should be made attractive to the workers both through financial incentives and through definite prospects for re-employment.

Older shipyard workers represented a special problem group. They were not prepared to undergo further training offered, e.g. by the Hamburg vocational training and education programme. Appropriate special measures would have to be taken in favour of this group in the process of conversion. As appropriate action in the field of restructuring and conversion is to a considerable extent still a learning process, it is to be hoped that the experience of the West German shipbuilding crisis can provide a lesson for defence industrial conversion, and for its implementation without undue job losses.

Notes

[1] Detlef Rother: The restructured west European shipbuilding industry, Institute of Shipping Economics and Logistics Bremen, Bremen, 1985, p. 40.

[2] Gerd Lilienfeldt, IG Metall, quoted in: Bo Strath, "Redundancy and solidarity: Tripartite politics and the contraction of the West European shipbuilding industry", in Cambridge Journal of Economics, Vol. 10, No. 2, 1986, p. 153.

[3] Detlef Rother (note 1), p. 40.

[4] Thomas Rother, "Subventionierung in den letzten zehn Jahren", in Hansa No. 9/10 1988, p. 474.

[5] In the Federal Republic of Germany an employee is able to go into early retirement if immediately 18 months prior to his 60th birthday he or she was registered as unemployed for one year or longer. In shipbuilding social compensation payments partially covered the pension losses that employees suffered.

[6] IG Metall Vorstand, Die Lage der Werfindustrie in der Bundesrepublik Deutschland, Frankfurt a. M., Feb. 1977 (Special emphasis by the author).

[7] See for the following: Verband der Deutschen Schiffbauindustrie e.V. Deutscher Schiffbau 1979, pp. 13/14.

[8] Strath, Bo, The Politics of de-industrialisation. The contraction of the West European shipbuilding industry, (Croom Helm, London u.a.) 1987, p. 31.

[9] See for example IG Metall, Stellungnahme zum Gutachten über Werften im Lande Bremen, Nov. 1982.

[10] IG Metall Vorstand, 8. Nationale Schiffbaukonferenz am 17. Aug. 1983, Hamburg 1983.

[11] See Kooperation Universität/Arbeiterkammer, Arbeiterverein "Use Akschen", "Irgendwie musste es ja weitergehen", 4 Jahre nach der Schliessung der AG "Weser", (VSA-Verlag, Hamburg) 1987 and Johann Gerdes, Heiner Heseler, Martin Osterland, Bernhard Roth, Gabriele Werner, Folgewirkung einer Betriebsstillegung. Mobilitätsprozesse auf dem lokalen Arbeitsmarkt, (Universität Bremen), Bremen 1987.

[12] Hans Ziegenfuss (former chairman of the shop steward committee), "Sozialpartnerschaft lohnt sich nicht", in: Heiner Heseler/Hans Jürgen Kröger (ed.) "Stell Dir vor, die Werften gehörn uns ...", Krise des Schiffbaus oder Krise der Politik? (VSA-Verlag, Hamburg) 1984, p. 122.

[13] The chairman of the board in an interview with Der Spiegel, 26 Feb. 1978.

[14] Statisches Landesamt Bremen, Statistische Berichte, No. 2, 1988.

[15] Johann Gerdes et al. (note 12), p. 113.

[16] Kooperation Universität/Arbeiterkammer, Arbeiterverein "Use Akschen" (note 12; Johann Gerdes et al. (note 12).

[17] Gerdes et al. (note 12), p. 172.

[18] See for the following: Bremische Bürgerschaft, Landtag, 12. Wahlperiode, Drucksache 12/245, 9 Aug. 1988.

[19] Frankfurter Allgemeine Zeitung, 28 April 1989, p. 21.

[20] Personal communication, 8 Feb. 1989.

[21] Bremische Bürgerschaft, Landtag, 12. Wahlperiode, Drucksache 12/245, 9 Aug. 1988, p. 14..

[22] Personal communication, 8 Feb. 1989.

[23] The following data are based on an interview with a company representative (17 Jan. 1989) if no other indications are made.

[24] Der Spiegel, 29 June 1981, p. 81.

[25] Quoted from: "Rheinstahl Nordseewerke weiter auf Erfolgskurs - In Erwartung einer Wettbewerbsverschärfung", in Hansa No. 9, 1975, p. 726.

[26] Frankfurter Allgemeine Zeitung, 30 March 1981, p. 18.

[27] Manager Magazine, No. 8, 1982, p. 43.

[28] Handelsblatt, 25 Nov. 1982, p. 13.

[29] Frankfurter Allgemeine Zeitung, 30 Mar. 1983, p. 15.

[30] For further developments with respect to this yard refer to Chapter 4.6.

[31] Weser Kurier, 5 Mar. 1979, p. 4.

[32] Süddeutsche Zeitung, 4 January 1989, p. 22.

[33] Die Welt, 18 Aug. 1987, p. 10.

[34] Personal communication, 30 January 1989.

[35] See Bürgerschaft der Freien und Hansestadt Hamburg, 12. Wahlperiode, Drucksache 12/137, 30 Dec. 1986 and Bürgerschaft der Freien und Hansestadt Hamburg, 13. Wahlperiode, Drucksache 13/1262, 23 Feb. 1988.

[36] Siegfried Bergner, Wissenschaftliche Begleituntersuchung zum Hamburger Aktionsprogramm Wirtschaft, Aktionsfeld: Qualifizierungsinitiative ("Fortbilden statt Entlassen"), Zwischenberichte of 25 Jan. 1988 and 2 May 1988.

[37] Grundsatzerklärung des Arbeitskreises "Alternative Fertigung" bei Blohm and Voss, quoted in: Otto Jacobi/Eberhard Schmidt/Walther Müller-Jentsch (eds.), Nicht vor - nicht zurück? Kritisches Gewerkschaftsjahrbuch 1982/1983 (Rotbuch Verlag, Berlin), 1982, pp. 105-106.

[38] (Klaus Schomacker/Peter Wilke/Herbert Wulf (eds.), Zivile Alternativen für die Rüstungsindustrie (Nomos Verlagsgesell-schaft, Baden-Baden), 1986, p. 124.

[39] Bürgerschaft der Freien und Hansestadt Hamburg, 11. Wahlperiode, Drucksache 11/2250, 3 April 1984, p. 5.

[40] See Heiner Heseler, "Gegen den Trend - Arbeitsmarkt und Strukturpolitik in Schweden -", in: WSI-Mitteilungen, Vol. 42, No.4, 1989, pp. 229.

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