

From shipbuilding to alternative maritime industry – The closure of Danyard Frederikshavn in 1999

BY THOMAS ROSLYNG OLESEN

The past 20 years has seen several studies on the decline of European shipbuilding. The existing research mainly examines the reasons for the decline but not the consequences of the shipyard closures. This article examines what happened after the closure of Danyard Frederikshavn in 1999. The first part examines the various attempts that were made to save the shipyard during the 1990's. The second part examines what activities were continued after the closure. It identifies six spin-offs and shows how the shipyard site was turned into a thriving business park with app. 1,000 jobs in 2011. The article furthermore shows how the activities gradually went from manufacturing in the late 1990's to maritime service activities in 2011. Finally the article presents a statistical survey which examines what happened to the app. 1,300 workers that lost their jobs when the shipyard closed. The survey shows that the workers mainly went to neighbouring sectors and that their competences were widely sought for in the local business community. The article concludes that the closure of Danyard Frederikshavn wasn't a breakdown but a transformation into new and more viable activities.

Introduction¹

The oil crisis in 1973 marked the beginning of a worldwide shipbuilding crisis. From 1975 to 1987 the amount of launched tonnage fell from 35,9 million GRT to 9,8 million GRT. The crisis was especially severe in Europe. From 1977 to 1985 the European market share fell from 41% to 18%. During the same period of time Asia increased its market share from 46% to 70%. A combination of lower wages, massive state subsidies and new efficient production plants allowed Japan, South Korea and later China to steal market shares through a vicious price dumping which led to the closure of most European shipyards from the late 1970's to the late 1990's.²

The dislocation of shipbuilding from Europe to Asia is one of the clearest examples of the decline of European manufacturing and the loss of industrial workplaces in Europe. In the early 1970's Denmark had more than ten mediums sized and large shipyards. After the oil crisis, however, the Danish shipyards began to experience increasing problems and in 1980 the first large shipyard – B&W in Copenhagen – went bankrupt.³ The closure of the B&W marked the beginning of a series of Danish shipyard closures during the 1980s and 1990s. In 2012 the last major shipyard – the A.P. Møller Mærsk owned Odense Steel Ship Yard at Lindø – was closed.⁴

The decline of Danish and European shipbuilding has received heavy attention from business historians and economists. The existing research on the topic mainly explains the reasons for the decline and the various attempts to save the ailing shipyards. Only few have, however, examined the consequences of the shipyard closures.⁵

This article investigates the time that followed the closure of Danyard Frederikshavn in December 1999. The article falls in three parts. The first part examines the closure of the shipyard

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from 1995 to 1999. The aim of this analysis is to identify the measures taken by the management to save the shipyard.

The second part of the article examines what activities were continued after the closure. This part examines (1) what spin-offs that were created after the closure, (2) who were the main entrepreneurs and investors behind the spin-offs, (3) what activities were continued in these companies and (4) what had happened to the spin-off companies in 2011 – ten years after the shipyard closure.

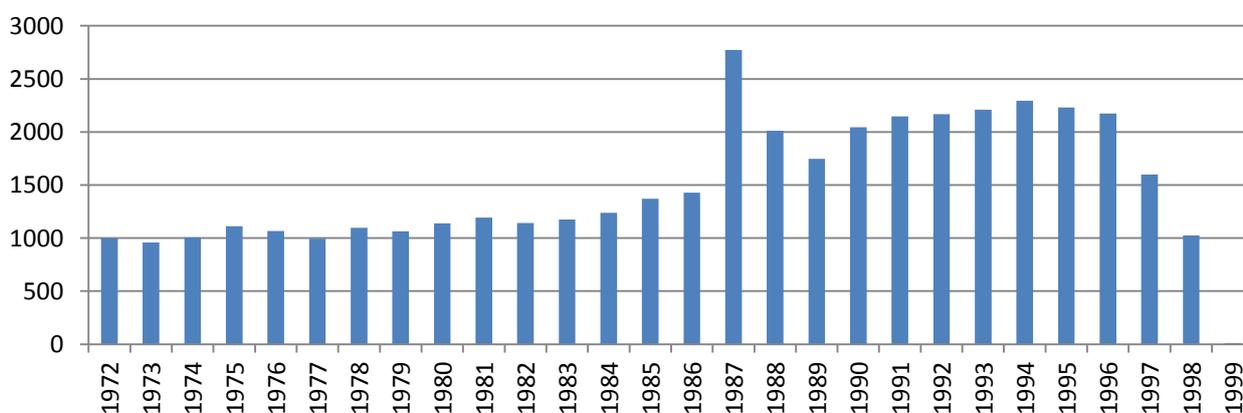
The final part of the article examines what happened to the employees at Danyard Frederikshavn after the shipyard closure. The source for this study is register data from Statistics Denmark. The *Integreret Database for Arbejdsmarkedsforskning* (Integrated Database for Workforce Research) is a unique database that covers the entire Danish Workforce and all Danish companies. In November every year since 1980 data has been collected giving a unique opportunity to follow the movements of the Danish workforce.⁶ The database allows us to identify 1,376 shipyard employees that left Danyard in the three years leading up to the closure in December 1999. From this dataset it is possible to examine what had happened to the population of former shipyard workers in November 2003 with regard to employment rate, geographical mobility, migration to other sectors, additional training etc. This gives several indications as to where and how the competences from the closed shipyard were used.

The article shows that knowhow and competences from Danyard were applied in new and more value added activities as the site was transformed from a shipyard into a business park with several small and medium sized companies engaged in maritime service activities.

Danyard Frederikshavn

The closure of Danyard Frederikshavn in December 1999 marked the end of a series of Danish shipyard closures in the late 1990's. The shipyard – which was founded in 1870 – had by the early 1970's established itself as the sixth largest shipyard in Denmark with approximately 1,000 employees and a dock capacity of 7,000 dwt. Situated in Frederikshavn – a town of app. 20,000 inhabitants in the northern part of Jutland – the shipyard was an important workplace for the local community. In 1987 it was merged with Aalborg Værft which increased the number of employees at the shipyard to 2,000 during the 1990's. At that occasion it was decided to change the name from Frederikshavn Værft to Danyard Frederikshavn.⁷

Figure 1: Average number of employees at Frederikshavn Værft (1972-1986) and Danyard (1987-1999)



Source: Annual reports from Frederikshavn Værft 1975-1986 and Danyard 1987-1999

Note: 1999 shows the employment at the end of the year and not the average employment

Danyard was in many respects very representative of the average Danish steel shipyard. As most Danish shipyards it was owned by one of the major Danish shipping companies. In 1913 it had been bought by DFDS (*United Steamship Company*) and in 1964 it became part of the Lauritzen Group, when the shipping company J. Lauritzen acquired the majority of shares in DFDS. In the late 1990's the Lauritzen Group was among the 15 largest companies in Denmark with an annual turnover of around 17 billion kroner. As a daughter company of J. Lauritzen Holding (JLH) Danyard had a strong owner who could support the shipyard with orders or capital if necessary.⁸

The production profile of Danyard Frederikshavn was very similar to the majority of the Danish shipyards. After the Oil Crisis in 1973 Danyard had turned to niche production of highly complicated ships which weren't as affected by the increased global competition as bulk ships or tankers. From the mid 1970's to the late 1990's the shipyard specialized in small naval ships, RO/RO ships, reefers and chemical tankers. In 1993 Danyard had furthermore taken over a GRP (Glass Reinforced Plastics) factory – Danyard Aalborg – from the closed Aalborg Værft. During the 1980's and 1990's Danyard Aalborg built a series of 14 highly advanced GRP-ships for the Danish Navy as well as two catamaran ferries in aluminium. Apart from shipbuilding Danyard had established a pipe factory at the site in Frederikshavn. The factory was set up in the early 1990's to support the building of nine chemical tankers to Stolt-Nielsen Parcel Tankers. Even though the pipe factory had costumers outside the Danyard Group the side production of pipes wasn't nearly as important as alternative production strings on other Danish Shipyards e.g. the engine factory at B&W in Copenhagen or the boiler factory at Aalborg Værft.⁹

The troubled 1990's

By the early 1990's most Danish shipyards found it difficult to obtain new orders. In December 1993, however, the Danyard management could celebrate the biggest order in the history of the shipyard. The order on seven highly advanced chemical tankers to the American shipping company Stolt-Nielsen Parcel Tankers secured the shipyard an order portfolio worth 5,2 billion DKK. The Stolt-Nielsen order was widely celebrated but in many ways it marked the beginning of the end for Danyard Frederikshavn.¹⁰

By 1995 the shipyard management began to realize that the chemical tankers were far more complicated than had been expected. Danyard's lack of experience with the ship type caused low productivity and resulted in costly delays. At the same time the shipyard experienced several problems with deliveries from subcontractors which only served to further complicate the matter. In addition to this a falling exchange rate on dollars resulted in heavy losses on the existing orders. As a consequence the shipyard suffered a devastating deficit of 490 million DKK in 1995. Danyard's banker – Sparekassen Nordjylland – began expressing serious doubts about the company's ability to handle the large Stolt-Nielsen order and demanded a guarantee from JLH that the owner would cover any losses that the shipyard might experience in 1995 and 1996. When JLH refused it caused a rapidly deteriorating relationship with Sparekassen Nordjylland and the Danyard management was forced to look for another banker. The situation was precarious and in December 1995 the owner increased the direct control with the shipyard by placing its CFO Bent Østergaard in the Danyard board. Three months later – in March 1996 – Danyard CEO Jens Viskinge Jensen was replaced. Danyard's technical Director Torben Mejnertsen became new CEO.¹¹

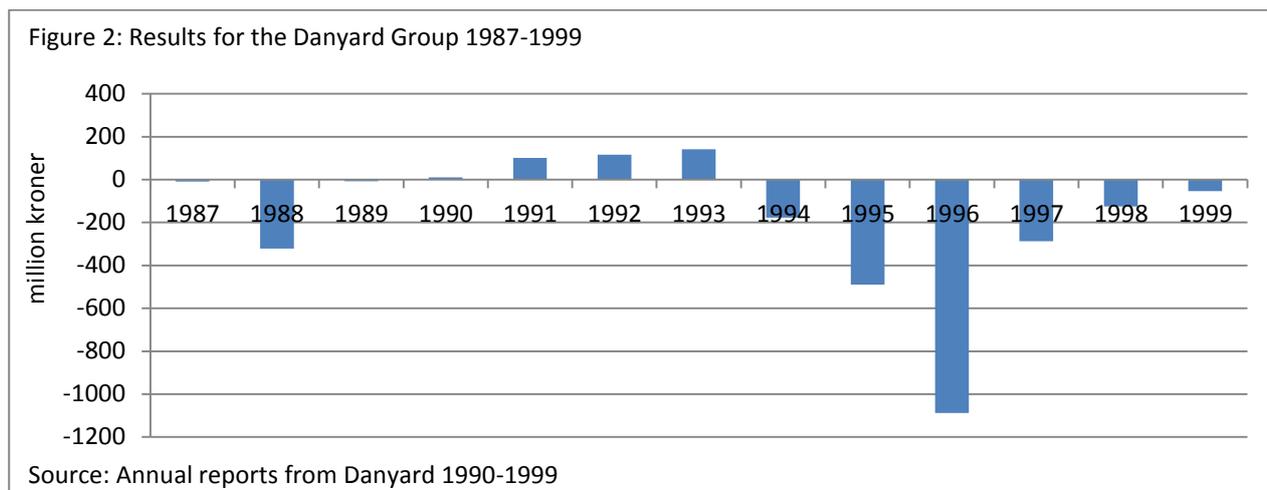
During the spring of 1996, however, the problems continued. In April the quarterly account showed a loss of 142 million DKK which was 100 million DKK worse than estimated. In May the board decided to prepare a plan for a closure of the shipyard after the last chemical tanker and alternatively try to find new investors. In August Teddy Jacobsen replaced Niels Bach as board

chairman and Bent Østergaard was elected new vice-chairman. Under the new chairman the board continued to work towards a closure, and by the end of August Teddy Jacobsen and Torben Mejnertsen presented a decommissioning plan to the JLH board. The parent company supported the plan and in September Torben Mejnertsen had meetings in the Ministry of Business Affairs (*Erhvervsministeriet*) to prepare for a gradual closure and secure the necessary funding for re-education etc. of the Danyard workers. Mejnertsen also met with the Steelworkers Union (*Dansk Metal*) in an attempt to increase the cooperation with the labour unions during the forthcoming closure. In order not to damage the morale of the workforce, the closure plans were, however, kept strictly confident.¹²

In late September 1996 JLH injected 500 million DKK into Danyard to reduce the debt and thus raise the confidence in the shipyard. This should secure the management room to work towards a controlled shut-down. By the end of the year, however, a new situation emerged that opened up for foreign investments and a possible sale of the ailing shipyard. In Malaysia the navy planned to expand the fleet with 27 new patrol vessels over the next 15-20 years. The ships were to be built on the naval shipyard in Lumut which, however, lacked the necessary know-how. Therefore the government planned to involve a foreign partner which should build one or two prototypes and deliver materials to further 6-8 ships. In December 1995 the naval shipyard in Lumut was bought by Penang Shipbuilding & Construction (PSC) which had been chosen by the government to lead the consortium that should build the patrol vessels. PSC was controlled by the 43-year old Amin Shah. Shah was an upcoming businessman in charge of a rapidly expanding business empire with shipyards in Malaysia and Ghana and with plans for acquiring further shipyards in USA and Europe. To Amin Shah Danyard was an ideal business partner. Danyard's daughter company – Danyard Aalborg – had exactly the military know-how Shah needed, and the shipyard in Frederikshavn could act as a European strongpoint in his expanding worldwide network of shipyards. For JLH – on the other hand – a deal with Amin Shah could be the first step towards a sale of the troubled Danyard Group.¹³

In July 1996 the two parts signed a Memorandum of Understanding. PSC offered to buy 48% of the shares in Danyard and 40% of the shares in Danyard Aalborg. The Malaysian company would inject 100 million US dollars in the Danyard Group and would afterwards get free access to the know-how pool in Danyard and Danyard Aalborg. The agreement contained three types of cooperation: (1) Shipbuilding, (2) technology transfer to the shipyards in Malaysia and (3) a training programme for Malaysian shipyard workers. The negotiations were continued and in December a Letter of Intent was signed. For Danyard the new ownership structure would lead to several changes. As part of Amin Shahs worldwide shipbuilding consortium the Danyard management expected the company to be increasingly engaged in R&D and less in shipbuilding. In March 1997 Danyard submitted a tender on the order of the first six patrol vessels in a consortium with Bath Ironworks and BAeSEMA along with four other bidders. This order marked an important precondition for the deal with Amin Shah.¹⁴

To JLH it was extremely important that nothing went wrong in the negotiations with Amin Shah. The shipyard was becoming a serious economic burden for the Lauritzen Group. In May 1997 Danyard presented a devastating 1996-deficit of 1,088 billion DKK. 400 million DKK were extraordinary provisions as part of the agreement with Amin Shah, but the loss of almost 700 million DKK meant that Danyard was becoming a threat to the stability of the entire Lauritzen Group.



As part of the agreement with Amin Shah, Danyard had agreed to secure a full order book. In order to fulfil this demand the management agreed to build another two chemical tankers to Stolt-Nielsen. The contract was signed in September 1997. In the meantime, however, a potential problem had arisen. In the summer of 1997 Thailand was struck by a severe economic crisis that quickly spread to Malaysia. As a consequence Amin Shah began to postpone the deal. In September – shortly after signing the agreement with Stolt-Nielsen – the Danyard management was forced to discuss the possibility of Amin Shah withdrawing from the deal. In October disaster struck. The Malaysian premier minister Mahathir overruled Amin Shah and decided to give the order to a German consortium. Danyard – which had just prolonged the order portfolio as part of the deal with Shah – was out of the picture.¹⁵

On the 1st of December 1997 the last hope for an agreement with Amin Shah disappeared. The following day JLH implemented several changes in the management. Apart from vice-chairman Bent Østergaard the entire board was replaced. Freddy Frandsen – CEO at Aalborg Industries – was elected chairman. Danyard CEO Torben Mejnertsen was replaced by Torben Erikstrup who had previously worked as technical Director at B&W Shipyard in Copenhagen and Kaj Christiansen from Sparekassen Nordjylland – Danyard’s former banker – became new CFO.¹⁶

The new management immediately began to develop a new strategy. The chairman made it clear that Danyard wasn’t in a position where the shipyard could take in new orders, but stated that everything should be done to finish the remaining orders with as few losses as possible. At this point Danyard had obtained loans from the parent company of app. 940 million DKK and in December and January Freddy Frandsen tried to secure the economic foundation of the shipyard by asking the owner for further economic support. On the 7th of January 1998 JLH agreed to inject 1,1 billion DKK. The parent company furthermore promised to support the completion of the remaining chemical tankers with another 1 billion DKK over the following two years. JLH thus kept on supporting the ailing shipyard.¹⁷

The new management saw two possible scenarios for Danyard: (1) to sell the shipyard, or (2) to shut it down. At first it was decided to search for new investors and from December 1997 to November 1998 the management made an effort to sell Danyard and Danyard Aalborg. During the summer of 1998 Freddy Frandsen had serious negotiations with Odense Stålskibs Værft and Aarhus Flydedok both of which showed an interest in Danyard Aalborg. No agreement was reached, however.¹⁸

It was equally hard to find potential investors for Danyard Frederikshavn. At a board meeting in May 1998 the chairman suggested that the shipyard should be offered to the neighbouring Ørskov Christensen's Stålskibsværft for free. This was, however, never carried out. Instead the board hired the consultants from Aros Securities to identify potential buyers but it was a difficult task to sell a shipyard that came out of 1997 with a deficit of 288 million DKK and a negative equity of 1,091,858,000 DKK. In the summer of 1998 the Danyard management had negotiations with one of the large Danish pension funds KP (*Kommunernes Pensionsforsikring*). KP, however, refused to invest in the shipyard without other industrially based investors. The management also had negotiations with Stolt-Nielsen and the Norwegian shipyard Mjellem & Karlsen in Bergen but without any results. On the 29th of October 1998 the chairman called off the search. Instead the board decided to work towards a closure of the shipyard after the delivery of the last chemical tanker in December 1999. In order to secure that the remaining orders were finished on time the board decided to keep the closure a secret thus avoiding damaging the morale at the shipyard.¹⁹

Preparing for the closure

The Danyard management and JLH found it very important to create as many new jobs as possible after the closure. At a board meeting on the 29th of October 1998 the board discussed the possibility of establishing a business park at the shipyard site. It was not uncommon that the management decided to establish a business park or a real estate company at the shipyard area. This had been the case at the closures of Elsinore Shipyard in 1983, Nakskov Shipyard in 1986 and B&W in 1996. At the closure of Aalborg Værft in 1987 JLH had secured almost 2,000 jobs in a business park on the former shipyard area, and the board agreed to draw on the experiences from that particular closure.²⁰

The establishment of a business park wouldn't just create new jobs for the former shipyard employees. It also aimed at solving another problem. Danyard didn't own the shipyard site in Frederikshavn, but rented the area from Frederikshavn harbour. If the rental agreement was cancelled the contract stated, that the area should be cleaned for all buildings and pollution. It was estimated that such an operation would cost 2-300 million DKK. By establishing a business park, however, the new company could continue JLH's activities on the former shipyard site after the closure without having to cancel the agreement with the harbour.²¹

The decision to close the shipyard was taken on the 29th of October 1998, and the following day the board informed the mayor and the local business council of the decision. Later that day the county (*amt*), municipality (*kommune*) and the local business council created a Foundation for Maritime Development and Cooperation (*Fonden Maritim Udvikling og Samarbejde*). It seems reasonable to assume that the foundation was established as a direct consequence of the decision to close the shipyard.²²

In January the foundation invited several wind turbine manufacturers to Frederikshavn. The aim was obviously to convince them to establish new production at the harbour. The facilities at the shipyard were well equipped to handle the large mill wings and towers. The workforce was experienced in producing and assembling large metal structures and the vicinity to the sea meant that the mills could easily be shipped off. Windmill production was thus an obvious way to create new jobs at the shipyard site. In February and March representatives from Tacke Windenergie GmbH and Vestas visited Frederikshavn to evaluate the production facilities. In the end, however, the wind turbine producers weren't convinced. Instead Vestas decided to establish a new factory on the former shipyard area in Nakskov.²³

The spin-offs from Danyard

Despite the failed attempt to establish wind turbine manufacturing at the shipyard site the Danyard directors managed to establish several new activities at the area. Through 1999 the management launched a series of alternative plans that resulted in the establishment of six spin-offs as shown in table 1. From May of 1999 to March 2000 five spin-offs were created followed by a sixth spin-off in 2006. Most of these spin-offs were established by Danyard CEO Torben Erikstrup and CFO Kaj Christiansen with extensive financial backing from JLH.

The first spin-off was established in May 1999 when the shipbuilding activities were taken over and continued by the neighbouring Ørskov Christensen's Stålskibsværft. The idea originated from September 1998 when Torben Erikstrup had met with the managements from Aarhus Flydedok and Ørskov Christensen's Stålskibsværft to discuss the possibility of merging the three shipyards. JLH had supported the idea but had emphasized that the activities should be continued in a new company and not as part of the Lauritzen Group.²⁴ In November Erikstrup met with the two Danish pension funds – Kommunernes Pensionsforsikring and Lønmodtagernes Dyrtidsfond – to discuss the possibility of raising capital for the new company. Both funds were positive about the idea of investing in a new joint shipyard. In February, however, the plan suffered a serious setback when Aarhus Flydedok was declared bankrupt. Shortly after the pension funds withdrew from the reconstruction plans. The Danyard management, however, continued to work for a reconstruction and on the 10th of March 1999 Freddy Frandsen and Torben Erikstrup met with Niels Ørskov to discuss the possibilities of creating a joint repair shipyard without Aarhus Flydedok.²⁵ This plan was, however, never realized. Instead the Ørskov management decided to rent 40% of the Danyard site for five years. The deal was signed on the 17th of May 1999 and the idea of an independent repair shipyard was abandoned by the Danyard management. As part of the agreement Ørskov got the right to purchase the rented area from Danyard between 2002 and 2009. A few months later Ørskov concluded an order on the completion of a Stolt-Nielsen chemical tanker similar to the ones that were built by Danyard. The ship had originally been contracted at a shipyard in Le Havre, which had, however, gone bankrupt in the attempt to build the highly complicated vessel. The workers at Danyard had extensive experience with this ship type and around Christmas 1999 app. 2-300 Danyard workers were hired by the neighbouring shipyard. Ørskov Christensen continued the shipbuilding activities at the Danyard site until 2003, when the company went bankrupt. It was later reconstructed as a repair shipyard named ORSKOV. In May 2009 ORSKOV bought the rented area from the business park and the company is still operating a repair shipyard on the former Danyard site employing app. 230 workers.²⁶

The second spin-off was the business park Frederikshavn Maritime Erhvervspark (FME) which was established in May 1999. During the spring the Danyard management had negotiated with the harbour authorities and in April 1999 it was agreed to allow a new company to take over the rental agreement from Danyard. FME was created on the 6th of May 1999 as a daughter company of JLH with Kaj Christiansen as CEO. The parent company made a direct investment of 20 million DKK in the business park and FME was furthermore given a loan on 50 million DKK from JLH. A loan of another 30 million DKK in Nykredit was at the same time transferred from Danyard to FME. On the 1st of June 1999 all fixed assets – worth app. 100 million DKK – were transferred from Danyard to FME. The first tenant was Ørskov Christensen's Stålskibsværft which expanded its activities to the Danyard site. The remaining area was rented to Danyard during the completion of the final Stolt-Nielsen chemical tanker.²⁷

Table 1: Spin-offs from the closure of Danyard in 1999						
Company	Background	Activity	Established	Closed	Entrepreneur	Investor
Repair shipyard sold to Ørskov	The shipyard	Shipbuilding	17.5.1999	No	Niels Ørskov & Danyard CEO+CFO	Ørskov Christensen's Stålskibsværft
FME	The shipyard	Business park	1.6.1999	No	JLH & Danyard CEO+CFO	JLH
Danyard Engineering	Design & engineering department	Counselling engineers	1.11.1999	Sept. 2003	Danyard CEO+CFO	Danyard CEO+CFO
Danyard Pipe	Pipe factory	Pipe Production	1.11.1999	No	Danyard CEO+CFO	Danyard CEO+CFO
Danyard Aalborg	Danyard Aalborg	GRP-shipyard/Factory	Sold on the 27.3.2000	30.6.2009	Danyard CEO+CFO	Danyard CEO+CFO backed by JLH
CH Marine Consult	Design & engineering department	Counselling engineers	Jan. 2005	No	Engineer from Danyard	Engineer from Danyard

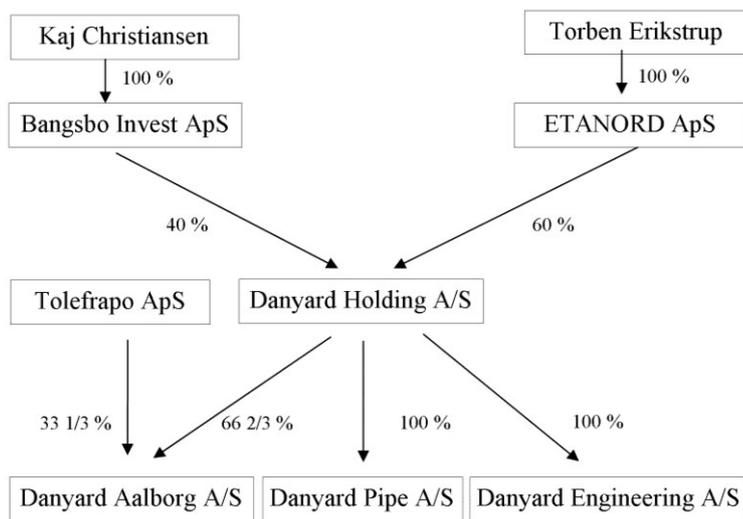
Source: Olesen, 2012, p. 251

In November 1999 another two spin-offs were created. The first was the pipe factory which was spun off as Danyard Pipe and the second was a consulting engineering company named Danyard Engineering.²⁸ The pipe factory had been established in the early 1990s as a consequence of the Stolt-Nielsen order. The Chemical Tankers required extensive piping and the shipyard management had invested several millions of DKK in new pipe production facilities.

The idea of establishing a pipe factory as an individual company arose in December 1998 – approximately a month after it was decided to close the shipyard. Initially the management had attempted to sell the factory. During the summer of 1999 the Danyard management was in contact with the pipe manufactures Logstor, Flensburg Shipyard and the steel manufacturing companies Sanistål and Bladt Industries. The attempts to find external investors were, however, unsuccessful. Instead Torben Erikstrup and Kaj Christiansen decided to acquire the pipe factory in a management buyout. The company only needed a very limited fixed capital as the production facilities were rented from FME. Danyard Pipe was established on the 1st of November 1999. Initially 13 former shipyard employees were hired. The company was established as a subcontractor for shipyards and the offshore industry but later managed to get orders for power plants and industry.²⁹

Danyard Pipe was closely linked to the newly established Danyard Engineering which was also acquired by Erikstrup and Christiansen in a management buyout. Danyard Engineering prepared the pipeline drawings and the pipes were afterwards produced at the pipe factory. Both companies soon became daughter companies of a newly established Danyard Holding which was also owned by Torben Erikstrup and Kaj Christiansen. The Danyard-name was acquired from JLH.³⁰ In a half year the number of employees had increased to app. 40. The company mainly had orders for shipyards in Denmark, Germany and Croatia. In 2005 Danyard Pipe was sold to Frederikshavn Køleservice and the two companies were afterwards merged under the name Victor Industri. During the gradual closure of European shipyards the company managed to find new costumers inland and in the offshore industry. These included BWSC (power plants), Logstor (pipe manufacturing) MAN Diesel (Ship engines) and National Oilwell (offshore and land drilling). In 2011 the Victor Industri – now named VICTOR – employed app. 70 workers.³¹

Danyard Engineering was established along with Danyard Pipe on the 1st of November 1999. The entrepreneurs were Torben Erikstrup and Kaj Christiansen who bought the company in a management buyout. The idea of creating a consultant engineering company went back to the beginning of 1999 when the design and engineering department at Danyard had initiated a close cooperation with Hauschildt Marine which was an engineering and design company. Hauschildt



was highly specialized in construction drawings and Danyard had great experience when it came to outfitting. The two companies establish a joint venture and in March 1999 they obtained their first design assignment for Flensburg Shipyard. The project was further expanded during 1999 and the Danyard management began to consider establishing a consultant engineering company. Through the autumn of 1999 Erikstrup and Christiansen searched for external investors for the company but it proved impossible. Instead the Danyard managers bought the design

and engineering department in a management buyout, and on the 1st of November 1999 Danyard Engineering was established.³² Apart from the drawings to Danyard Pipe the company had design and engineering assignments for shipyards in Germany, Poland, Croatia and the Netherlands. Until 2002 it employed between 12 and 15 former Danyard engineers. From 2002, however, it became increasingly difficult to get new assignments. In an attempt to find new costumers the company tried to enter the offshore sector and the land based oil industry. The management wasn't, however, able to obtain new orders and in 2003 it was decided to shut the company down.³³

The fifth spin-off was Danyard's daughter company Danyard Aalborg which the Danyard management had tried to sell since 1996. First to Amin Shah and PSC and later to Aarhus Flydedok and Odense Stålskibs Værft. On the 27th of March 2000, however, Erikstrup and Christensen decided to buy 2/3 of the shares in the GRP-factory in a management buyout. The remaining 1/3 of the shares were sold to the investment company Tolefrapo ApS. The sale was made on very favourable conditions as JLH was eager to disengage from the shipbuilding activities. Danyard Aalborg became a daughter company of Danyard Holding and sister companies to Danyard Pipe and Danyard Engineering. At the time of the sale the GRP-factory employed app. 150 workers, and the order book was full.³⁴ In 1999 Danyard Aalborg had signed a five year maintenance agreement with the Danish navy on the 14 Standard Flex 300 patrol vessels which had been built at Danyard Aalborg from 1988 to 1995. Danyard Aalborg had furthermore obtained an order on a 38 meter super yacht for the Danish shipbroker Royal Denship. Erikstrup and Christiansen saw great possibilities in the markets for naval ships and luxury yachts. The Danish navy planned to build a new series of surface ships and the extensive experience with naval ships meant that Danyard Aalborg had a good chance of obtaining the order. The widely celebrated Standard Flex 300 vessel had furthermore resulted in increased attention from foreign countries that planned on expanding their navy. The market for luxury yachts was equally promising. In 1999 the shipbroker Peter Johansen from Royal Denship expected that he could sell another five or six yachts to the American market before 2006. On the 9th of August 2000 he ordered a second luxury yacht from Danyard

Aalborg, and in the following years Danyard Aalborg had a close relationship with Royal Denship³⁵. The shipbroker found potential buyers via sales offices in St. Tropez and Fort Lauderdale and had the ships built at shipyards in Denmark. In December 2003 Danyard Aalborg delivered its third luxury yacht to Royal Denship – the 77 meter Princess Mariana. From 2004 a falling exchange rate on dollars, however, made it too expensive for Americans to buy their yachts in Europe. And when the maintenance contract with the Danish navy stopped in 2005, the management was unable to obtain new orders. From 2006 to 2009 the Danyard Aalborg had no activities and in June 2009 the company was dissolved.³⁶

The Danyard site after the closure – from manufacturing to service activities

On the 14th of December 1999 Danyard delivered its last ship – the chemical tanker *Stolt Innovation*. At the time of the closure app. 450 new jobs had been created at the shipyard site. 15 companies had rented 52% of the shipyard area (table 2) and it was estimated that app. 200 former Danyard-employees had found a new job in the business park. In 2003 it was decided to turn an old silo at the harbour into an office building. To this purpose *The Kattegat Silo Foundation* was established by FME, the municipality and the business council in January 2004. The project amounted to app. 100 million DKK which was partly financed by The European Union (17 million DKK) and a loan from JLH (30 million DKK). In April 2006 the Silo was finished and 12,500 square meters of office space was added to FME.³⁷

Most of the jobs at FME were created by outside companies which moved into the business park. Apart from Ørskov Christensen's Stålskibsværft these companies included KK-Electronic and SEMCO Maritime which could use the facilities and the know-how among the former Danyard employees. Both companies produced electronic devices. KK-Electronic's main customer was the

Tenant	Activity
Altek Isolering A/S	Insulation
AMCNC	Carpenter
CC Nordjylland	Call-center
Danyard Engineering A/S	Maritime Engineering
Danyard Pipe A/S	Pipe factory
Delta System DK A/S	Scaffolding and Tents
ISS Industriservice	Cleaning
KK Electronic A/S	Electronics
Marine Innovation Group	Marine consultant
Sanistål Marine	Steel wholesale
Semco Maritime	Maritime Electronics
Skagen Sansblæseri	Painting/sandblasting
Sonofon	Telecommunication
Ørskov Chr. Stålskibsværft	Shipyard
Aalborg TVR	TV & radio

Source: "FME: Internt regnskab for 1999 og estimater for 2000-2003", FME

wind turbine industry while SEMCO Maritime had many customers in the maritime industry and had been an important subcontractor for Danyard. Both companies moved into the business park in 1999 and hired most of the electricians from the shipyard. SEMCO was later sold in a management buyout and the name was changed to Scanel International. Today the company provides technical solutions and a wide range of service activities for the marine and offshore sector. KK-Electronics gathered its activities in Herning and Ikast and is no longer present in FME.³⁸

The continuation of alternative maritime activities and the vast know-how about shipbuilding in the area also resulted in the establishment of several new companies in the business park. Among these was Vestergaard Marine Service which was established in 2003 by two entrepreneurs. The company provides repair and maintenance services on diesel engines on

maritime and offshore installations and on power plants. In 2011 the company had expanded to app. 110 employees. Another example of a successful upstart was the counselling engineering company CH Marine Consult which was established in 2006 by a former Danyard engineer and thus marks the sixth Danyard spin-off. CH Marine Consult builds on the extensive knowhow on pipeline constructions that was present at Danyard. The company has successfully managed to find new

customers after the decline of European shipbuilding. Today the main customer is the Norwegian offshore industry including companies like PGS, STX Offshore and Rolls Royce Marine and land based industry counting companies like Victor (pipe manufacturing), Vestas (wind turbines) and BWSC (Power plants). The company had 10 employees in 2011.³⁹

In April 2011 app. 964 jobs had been established in FME divided among 59 companies. This was approximately equal to the number of jobs at the shipyard in the 1970's and the early 1980's.⁴⁰ Only 90 jobs, however, derived from Danyard spin-offs and app. 320 if the jobs at Orskov were included. The reason for the low number of jobs in direct spin-offs is obvious. Danyard didn't have any important production strings apart from shipbuilding like the boiler factory at Aalborg Shipyard or the Engine factory at B&W in Copenhagen. This means that the spin-offs were few and small. The creation of FME, however, resulted in the creation of several new jobs at the site as new companies were established or moved to the area. The fact that expensive equipment could be rented at reasonable prices lowered the cost on fixed assets and created good conditions for new startups. The closure of Danyard furthermore gave easy access to a vast pool of know-how on shipbuilding and maritime activities. Finally the clustering of many maritime activities on the site makes way for know-how transfer and cooperation among the companies.⁴¹

FME was still dominated by maritime companies in 2011. Since 2000 the number of employees in maritime companies has risen from 482 to 792. The share of workers engaged in maritime activities has, however, decreased slightly from 92% in 2000 to 82% in 2011. From the late 1990's to 2011 the area has seen a gradual shift from manufacturing to maritime service activities. The clearest indicator of this development was the transformation of FME's largest tenant – Ørskov Christensen's Stålskibsværft – which was closed down as a newbuilding shipyard in 2003 later to re-emerge as the repair shipyard Orskov.⁴² As a newbuilding shipyard Ørskov Christensen's Stålskibsværft was exposed to competition from shipyards low-wage countries all over the world but now the main competitors are repair-shipyards in the Baltic region.

The dispersion of know-how from Danyard Frederikshavn⁴³

Whereas the previous pages have examined the creation of spin-offs and new activities at the Danyard site the following part examines what happened to the workers which lost their jobs at the shipyard. The study of workforce movements in the Danish labour market is possible thanks to a unique register data base from Statistics Denmark. Every November since 1980 Statistics Denmark has gathered data about the entire Danish workforce and all Danish companies in The Integrated Database for Workforce Statistics (IDA). By comparing changes from one year to the other it is possible to follow movements in the workforce very accurately. The database thus allows us to identify the population of workers who left the shipyard between November 1997 and November

Table 3: Training, mobility and dispersion of employed workers from Danyard Frederikshavn		
Data collection	1997-1999	
Population	1,376	
	Number	percentage
Employed in November 2003	884	64,2 %
Of which...		
... has a higher education	47	5,4 %
... has moved municipality	78	8,8 %
... is employed in a top-5 company	205	23,2 %
Source: Statistics Denmark, the IDA Database		
Note: Top-5 companies are the five companies in which most workers from the population has been employed		

1999. According to IDA this population included 1,376 persons. By examining what had happened to this population in November 2003 – app. four years after the closure – it is possible to identify changes in employment, education, residence etc. It is thus possible to examine where the workers were reemployed, if they received additional training, if their competences could be used in the local business community or if they

were forced to move in order to get a new job.

In order to determine to what extent the competences from Danyard Frederikshavn were actually used in other parts of the Danish labour market the reemployment rate among the workers has been examined. According to the data in table 3 app. 64% of the 1,376 Danyard employees had found new jobs by November 2003. This is more or less the same rate of reemployment as was seen at the closures of other Danish and Swedish shipyards in the 1980s and 1990s. Two and a half years after the closure of Elsinore Shipyard in 1983 app. 66% of the former shipyard employees had found new jobs and at the closure of the Uddevalla Shipyard in Sweden in 1986 app. 63% found new jobs within 2½ years.⁴⁴ Studies of the closures of Nakskov Shipyard in 1986, Aalborg Shipyard in 1987 and B&W Shipyard in 1996 further shows that between 60% and 70% of the laid off workers had found new jobs after three years.⁴⁵ The reemployment rate at Danyard was thus more or less equivalent to that of other contemporary shipyard closures in Scandinavia.

	Danyard
Population of laid off workers	1376
Employment rate among workers aged.....	
... under 26 years	73,1 %
... 26-40 years	75,2 %
... 40-55 years	65,5 %
... more than 56 years	15,7 %
Average employment for shipyard	64,2 %
Source: Statistics Denmark, the IDA-database	

In order to further examine the level of reemployment the population of Danyard workers has been divided by age and level of education. From table 4 it is evident that the reemployment rate was above average for the workers under 56 years of age. For workers who were older than 56 years of age the rate of re-employment fell remarkably to app.

16%. The explanation is most likely that aged workers retired from the workforce. Compared to other Danish shipyard closures, however, an employment rate of 16% for this population is very high. At the closures of Nakskov Shipyard in 1986, Aalborg Shipyard in 1987 and B&W Shipyard in 1996 only 7-12% of the workers who were older than 56 years of age found new jobs. The high level of reemployment among this group of workers suggests that their competences were sought for. Interviews with former Danyard workers has shown that many of the Danyard employees aged 56 and above were hired by the neighboring Ørskov Christensen's Stålskibsværft.⁴⁶ Furthermore it is very likely that many were hired by the new companies that were established in FME.

Table 5 shows the reemployment rate divided by level of education. Like most other shipyards the population of Danyard workers consisted of app. 25% white-collar employees and 75% blue-collar workers. App. 16% of the population was unskilled workers while 58% were skilled workers.⁴⁷ Studies of other Danish shipyard closures show a clear link between level of education and the rate of reemployment.⁴⁸ At the shipyard closures in Nakskov, Aalborg and B&W the level of reemployment was highest for employees with higher education and lowest for unskilled workers. At the closure of Danyard Frederikshavn, however, the link between level of education and reemployment rate is less clear. Table 5 shows that the reemployment rate was the

	Danyard
Population of laid off workers	1376
Employment rate among...	
... unskilled workers	64,9 %
... skilled workers	64,4 %
... further (non-academic) education	62,5 %
... higher education	78,6 %
Average for the shipyard	64,2 %
Source: Statistics Denmark, the IDA-database	
Note1: Unskilled workers are persons with elementary school or high school as their highest level of education	
Note2: The term "further education" refers to the Danish "kort eller mellemlang videregående uddannelse". It includes non-academic degrees of 2-4 years. Nurses, teachers etc. are included in this group.	

reemployment rate was the

same for unskilled and skilled workers and even a bit lower for the group with further education. The relatively high level of reemployment among skilled and unskilled workers is probably related to the local business structure in Northern Jutland which was characterized by several maritime service companies – shipyards in Frederikshavn and Skagen and engine factories in Frederikshavn and Hirtshals. The lower reemployment rate among workers with further education is probably caused by a relatively limited public sector and few service jobs in the area compared to larger cities.

In order to evaluate to what extent the competences from Danyard could be used in other parts of the Danish business community the level of additional training among the 884 reemployed workers has been examined. A low level of additional training suggests that the competences could be used in other parts of the Danish business community whereas a high level of reeducation suggests a lower demand for the know-how gathered among the workers. From table 3 it appears that only 5,4% of the reemployed workers had been reeducated. In the IDA-database, however it is only possible to identify changes in the “highest level of education”. This means that a worker who received a truck-certificate or person who has taken a lower degree than his/her highest level of education won’t appear in the data.

	Danyard
Employed workers by November 2003	884
Reeducated workers aged...	31.6 %
... under 26 years	3.5 %
... 26-40 years	1 %
... 40-55 years	0 %
... over 56 years	31.6 %
Average for the shipyard	5,40 %

Source: Statistics Denmark, the IDA-database

The actual level of additional training is thus probably somewhat higher than the 5% shown in table 3. Even when this is taken into account the level of retraining is extremely low which suggests that the competences could be used directly in other parts of the Danish business sector.

Table 6 shows that it was almost exclusively workers under 26 years of age which were reeducated. This seems reasonable and corresponds well to studies of shipyard closures in Nakskov, Aalborg and Copenhagen.⁴⁹ However table 4 shows that the workers aged 26 to 55 had exactly the same reemployment rate as the workers below 26 years of age – even if this group received very little or no additional training. This further indicates that additional training was of minor importance.

From	To	Danyard
Unskilled worker	Skilled worker	49,0 %
Skilled worker	further (non-academic) education	29,8 %
Other types of re-education		21,3 %
Total		100,1 %

Source: Statistics Denmark, the IDA-database
 Note1: Unskilled workers are persons with elementary school or high school as their highest level of education
 Note2: The term “further education” refers to the Danish “kort eller mellemlang videregående uddannelse”. It includes non-academic degrees of 2-4 years. Nurses, teachers etc. are included in this group.

When examining the type of reeducation, table 7 shows that app. 50% of the reeducated workers were unskilled workers taking some kind of vocational education while 30% were skilled workers taking a further non-academic education of 2-4 years. No Danyard workers took a higher education. It is, however, important to keep in mind that this group only includes 5,4% of the reemployed Danyard workers. Most Danyard employees were, thus, able to move directly to a new job without additional training.

When examining the mobility of the 884 reemployed Danyard workers, table 3 shows that 8,8% moved to another municipality in order to find new jobs. This is a remarkably low mobility compared with other Danish shipyard closures where between 12% and 20% of the reemployed workers moved municipality in order to find a job.⁵⁰ The low rate of mobility among the

reemployed Danyard workers suggests that their competences could be used in the local and regional business community. It is necessary to keep in mind that only app. 50% of the Danyard workers actually lived in Frederikshavn so the competences didn't necessarily stay in Frederikshavn. It seems reasonable, however, that many found new jobs at the remaining shipyards and engine factories in the region or in the new companies which emerged in FME.⁵¹

Finally table 3 shows a relatively high dispersion of the former Danyard workers. By November 2003 only 23% of the 884 Danyard workers had jobs in the five companies that hired the most Danyard employees. This is a much higher level of dispersion than was seen on the Danish shipyard closures in the 1980's. At the closures of the shipyards in Aalborg and Nakskov app. 30-40% of the workers were re-employed in the top-five companies. The Aalborg closure saw several

Population	884
Primary Sector	1,9 %
Manufacturing of...	
... food and textiles	5,8 %
... wood and paper	0,7 %
... chemistry and plastics	1,9 %
... iron, steel and machinery	19,2 %
... electronics	6,0 %
... transport (incl. shipbuilding)	17,7 %
Manufacturing	51,2 %
Supply	0,1 %
Construction	15,8 %
Trade, hotels and restaurants	5,4 %
Transport	4,1 %
Business service	8,6 %
Public	8,6 %
Other service activities	4,2 %
Service	46,8 %
Total	100 %

Source: Statistics Denmark, the IDA-database

large spin-offs which secured new jobs for many of the shipyard workers and in Nakskov there were only few companies left in the region to pick up the workers. This explains the low level of dispersion in the two cases.⁵² In Frederikshavn the spin-offs were few and small and the regional business structure characterized by many small and medium sized companies. This caused a much larger dispersion of the former employees. The geographical dispersion might, however, be lower than the number indicates. It seems very likely that the Danyard employees were scattered among the many smaller companies that were established in FME after the closure. So even though only 23% were employed in top-five companies the number employed in the FME-area is probably much higher.

In order to examine how the competences from Danyard were used it has been examined in which sectors the 884 Danyard workers were reemployed by November 2003. From table 8 it appears that app. 51% of the workers continued in manufacturing. The workers mainly went to neighboring sectors like manufacturing of

iron and machinery (19,2%) or shipbuilding (17,7%). This was probably the result of a regional business structure characterized by many maritime manufacturing and service companies. Many workers continued in shipbuilding at the remaining shipyards in the region – primarily at the neighboring Ørskov Christensen's Stålskibsværft – and others probably went to the engine factories in the region – Alpha Diesel in Frederikshavn and Wärtsilä in Hirtshals. Furthermore many found jobs in the new companies that were established in FME.

Table 8 also shows that app. 47% went to the service sector – mainly to construction (16%). This group included painters, carpenters and electricians but probably also many unskilled workers. Furthermore many former Danyard workers – namely electricians – were hired by KK-Electronic and SEMCO Marine which moved into the business park in 1999. In the database these companies

would most likely appear under “construction” even though they were actually engaged in maritime service activities.

Finally the table shows that only very few (1,9%) went to the primary sector. The number might, however, be much larger. The 884 workers only include those who have found jobs in Denmark. With its close vicinity to Norway it seems reasonable to suggest that many would seek jobs in the expanding Norwegian oil industry. These workers would, however, not show in the database as IDA only covers the Danish labour market.

The relatively high level of reemployment combined with a low level of additional training and migration to neighboring sectors suggests that the competences from Danyard were actually widely used in other parts of the Danish business community. The low level of mobility among the reemployed workers further indicates that the competences were mainly used locally and regionally. This is probably the result of a regional business structure that matched the shipyard workers competences well.

Conclusion

The past 60 years has seen an increasing dislocation of industrial production from the western world to low cost countries. The decline of European shipbuilding is in many ways a key example of this development. In contrast to most existing literature on the decline of European shipbuilding this article has examined what happened after the closure. The analysis has shown that a shipyard closure didn't necessarily lead to a loss of workplaces. Instead it forced the local companies to rethink their business strategies and use their competences in new ways.

When Danyard began to experience problems in the mid-1990's the owner, J. Lauritzen Holding, made several attempts to sell the shipyard. This strategy was given up in October 1998. Instead a plan was developed for the continuation of the viable activities and for the establishment of a new business park in the area. In the meantime the heavy losses of more than 2 billion DDK were covered by the parent company in order to secure a controlled shutdown.

In December 1999 the unprofitable activities at Danyard were finally shut down. The viable activities – the pipe factory, the GRP-factory and the design and engineering activities – were sold in a management buyout and continued after the closure. Even the shipbuilding activities were continued on the Danyard site by the neighboring Ørskov Christensen's Stålskibsværft. The closures of B&W Shipyard in 1980 and Aalborg Shipyard in 1987 saw many large spin-offs which continued divisions like the engine factory at B&W or the boilers division in Aalborg. These spin-offs created several thousand jobs for the former shipyard employees.⁵³ At the Danyard closure, however, only few jobs were continued in the spin-offs. Instead the establishment of Frederikshavn Maritime Erhvervspark paved the way for entrepreneurs who wanted to use the competences at the shipyard in new ways. After the closure a vast pool of know-how on shipbuilding and maritime activities was easily accessible in the area and the business park limited the need for investments in fixed assets for companies which established themselves on the Danyard site. In the following years the establishment of several companies engaged in maritime service activities helped to create a business environment with good conditions for knowhow transfer and cooperation in the area.

The former Danyard owner, J. Lauritzen Holding, has played an important role in this development. Even though the Lauritzen Group refused to engage in the continuation of activities from the shipyard its investments in FME were decisive for the development of the business park.

Since the late 1990's the activities at the Danyard area have seen a gradual change from manufacturing activities to maritime service activities. In 2011 app. 1,000 jobs had been created at the former shipyard site. Approximately the same number of employees worked at the shipyard in

the 1970's and early 1980's. This article has shown that the closure of Danyard Frederikshavn wasn't just a closure but a transformation to new and more viable activities. This brings a new perspective in a time where the loss of Danish manufacturing jobs is more relevant than ever.

Sources and literature

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The various sources from Danyard Frederikshavn – board minutes, internal notes etc. – are found at the Danyard archive in Frederikshavn Maritime Erhvervspark in Frederikshavn.

The statistics on workforce movements have been found in the IDA-database provided by Statistics Denmark.

Interviews:

Kaj Christiansen: CFO at Danyard Frederikshavn from 1997 to 2000 and from 2000 until present was CEO in Frederikshavn Maritime Erhvervspark.

Torben Erikstrup: CEO at Danyard from 1997 to 2000.

Bent Østergaard: CFO in JLH from 1993 to 1996; CEO in JLH from 1996 until present and vice-president in the Danyard board from 1996 to 2000.

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² Stopford, 2009, p. 615-626; Bruno & Tenold, 2011, p. 8-9; Jonsson, 1996, p. 26-30, 60, 77-86, 96 & 122; Amsden, 1989, p. 269-277; Poulsen & Sornn-Friese, 2011, p. 561-2

³ The B&W was reconstructed in 1981 under the name B&W Shipyard which continued shipbuilding activities on Refshaløen in Copenhagen until the final closure in 1996.

⁴ Jeppesen, 2001, p. 43-48; Kamedula, 1987A; Søndergaard, 2007; Olesen, 2012a, p. 4

⁵ For the only exceptions see: Olesen, 2012a; Olesen, 2012b; Storrie, 1996; Andersen, 1996; Storrie and Andersen, 1996

⁶ Zeuthen (et. al.), 1990, p. 4

⁷ Danyard Frederikshavn and Aalborg Værft were both owned by the Danish shipping company J. Lauritzen. The merger in 1987 was decided after Aalborg Værft ran into economic problems in the mid 1980s. The merger didn't, however, solve the problems and in March 1988 the steel shipyard in Aalborg was finally shut down. The spin-off company, Danyard Aalborg, continued shipbuilding in GRP (Glass Reinforced Plastics) for the Danish Navy during the 1990s. See Olesen, 2012a, p. 145-149 & 165-168; Nielsen, 2012, p. 249-61

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³³ Erhvervsbladet: "Maritim specialist vil nu også på land (Johnny Carstensen) 27/8 2002; *Nordjyske*: Ingeniørfirma er klemt (Hanne Albæk) 7/4 2003; *Børsen*: "Danyard lukker ingeniørselskab (Niels Carstensen)" 22/9 2003

³⁴ Press release from Danyard Holding 27/3 2000; Olesen, 2012a, p. 246

³⁵ Press release from Danyard Aalborg 9/8 2000: *Danyard Aalborg og Royal Denship indgår ny kontrakt om motoryacht*; *Børsen*: "Han tror på Danyard (Niels Carstensen)" 12/4 2000

³⁶ *Børsen*: "Luksusbåde koster Danyard (Niels Carstensen)" 21/6 2001; *Børsen*: "Danyard på vej (Niels Carstensen)" 25/6 2002; *Nordjyske*: "Sidste udkald (Peter Brock)" 29/1 2004; *Nordjyske*: "Danyards fremtid (Peter Brock)" 12/3 2005; Interview with Danyard CFO Kaj Christiansen

³⁷ Board minutes and directors report from Danyard board meeting 30/11 1999; Christensen, 2010, p. 278-287; interviews with JLH CEO Bent Østergaard and Danyard CFO Kaj Christiansen

³⁸ Interview with Danyard CFO Kaj Christiansen; <http://www.scanel.dk/competences>

³⁹ <http://www.chconsult.dk/References.html>; *Medarbejdere på FME området 2000-2011*, internal note from FME in April 2011; Interview with Danyard CFO Kaj Christiansen; <http://www.vms.dk/>

⁴⁰ *Medarbejdere på FME området 2000-2011*, internal note from FME in April 2011

⁴¹ VICTOR: app. 70 employees, CH Marine Consult: app. 10 employees and FME: app. 10 employees. App. 230 workers are employed at ORSKOV

⁴² *Medarbejdere på FME området 2000-2011*, internal note from FME in April 2011; Interview with Danyard CFO Kaj Christiansen; Christensen, 2010, p. 283-287; *Nordjyske*: "Ingeniørfirma holder værftsbyen i hævd (Hanne Albæk) 26/6 2008; Olesen, 2012a, p. 249

⁴³ This part of the article wouldn't have been possible without invaluable help from assistant professor, PhD, Jacob Rubæk Holm from Department of Business and Management at Aalborg University who has extracted the data from the IDA-database.

⁴⁴ Storrie, 1996, p. 195-201; Andersen 1996, p. 182

⁴⁵ Olesen, 2012a, p. 278

⁴⁶ Interview with Danyard CFO Kaj Christiansen

⁴⁷ Olesen, 2012a, p. 285

⁴⁸ Olesen, 2012a, p. 287

⁴⁹ Olesen, 2012a, p. 288

⁵⁰ Olesen, 2012a, p. 278

⁵¹ Interview with Danyard CFO Kaj Christiansen

⁵² Olesen, 2012a, p. 278-282

⁵³ At the closure of Aalborg Værft in 1987 the spin-off activities secured app. 2,000 new workplaces. At the closure of B&W in 1980 most of the workers continued directly over in the spin-off activities which led to a minimal loss of workplaces. Olesen, 2012a, p. 180 & 294