Internship Nakilat Damen Shipyards Qatar

1. Title page

Name: Lars Nijland
Student number: s1018000
Mail: l.k.nijland@student.utwente.nl
Company: Nakilat Damen Shipyards Qatar LTD.

Department: Operations
Company site: www.ndsq.com.qa

Supervisors: Huib Slings – Director Production
Wolter ten Bokkel Huinink – Project Manager

Period: 01-09-2015 – 20-12-2015
Institution: University of Twente - The Netherlands
Faculty: Engineering Technology
Study: Mechanical Engineering – Production Management
Supervisor University: dr. ir. S. Hoekstra

Erhama bin Jaber al-Jalahma Shipyard
Southern Breakwater
Ras Laffan Industrial City
P.O. Box 25551 Doha
State of Qatar

2. Voorwoord

2.1 Ervaring NDSQ

Mijn keuze voor Damen is vooral gekomen door verhalen van medestudenten over stageplekken en ook door verhalen over de business course. Daarnaast wilde ik graag de productie van grootschalige producten een keer van dichtbij meemaken, zoals bijvoorbeeld producten in de scheepsbouw en/of offshore. Via een open gesprek met een recruiter werden zowel de mogelijkheden bij Damen als mijn competenties en wensen besproken. Nadat het gesprek van beide kanten was bevallen is mijn verzoek tot een stage in het buitenland met als voorkeur het Midden-Oosten uitgezet bij een aantal Damen scheepswerven. Vanuit Qatar werd al snel gereageerd door Huib, de Director Operations van NDSQ. Ik moet over het algemeen zeggen dat Damen en NDSQ altijd erg snel hebben gereageerd en erg behulpzaam zijn met het vinden van een plek. Enkel een persoonlijk gesprek met Huib toen hij voor een korte tijd in Nederland was, was nog nodig om de stage definitief te bevestigen.

NDSQ is een vrij uniek werf om mee te maken, ten eerste bestaat het nog maar 5 jaar, ten tweede omdat er nu al honderden mensen werken van meer dan 25 verschillende nationaliteiten en de werf gebouwd is met alle faciliteiten en uitrusting die een werf kan wensen. In mijn geval waren voornamelijk de Nederlanders Huib en Wolter mijn begeleiders. Ondanks dat je in hoofdlijnen een opdracht hebt om uit te voeren was ik ook erg vrij. Voor mij had dit als voordeel dat ik bijvoorbeeld tussendoor bezig ben geweest met een data-analyse wat ik erg leuk vond, maar ook als nadeel dat ik soms wel redelijk in het diepe werd gegooid. Achteraf denk ik dat dit in principe een erg leerzame manier is om een student zelfstandig aan het werk te krijgen, maar soms had ik wel het idee dat ik meer voor elkaar had kunnen krijgen met wat extra sturing. Eigen initiatief is dus wel noodzakelijk om mee te kunnen werken in het bedrijf, als je dit laat zien is iedereen ook erg behulpzaam en geduldig om je te helpen. Van veel afdelingen heb ik dan ook wel iemand gesproken die de tijd nam om uit te leggen wat zijn/haar verantwoordelijkheden en functie binnen het bedrijf was. Ook gewoon een rondje lopen op de werf en wat mensen aanspreken om te vragen wat ze precies aan het doen zijn en hoe dit werkt is een erg leuke en leerzame manier om meer over de scheepsbouw te weten te komen. Het ontmoeten van mensen in het kamp die een tijdelijke klus hebben bij NDSQ heeft hier ook zeker in meegeholpen.

De uitdaging binnen NDSQ is vooral dat het te maken heeft met veel regels en procedures (voornamelijk door joint venture partner Nakilat en door (de overheid van) Qatar in het algemeen). De andere uitdagingen liggen bij het werken met ontzettend veel verschillende nationaliteiten en het feit dat de werf nog maar 5 jaar bestaat. Er is dan dus ook nog genoeg te doen en te verbeteren wat het een zeer interessante stageplek maakt, maar er zijn ook genoeg moeilijkheden en belemmeringen die het juist lastig maken.

Ik ben uiteindelijk blij dat ik hier terecht ben gekomen voor mij stage. Er zijn misschien makkelijkere plekken en meer open plekken in de wereld waar je zou stage kunnen gaan lopen, maar juist dat maakte deze stage erg leerzaam, uitdagend en dus ook leuk. Als je hier dus open voor staat zou ik het zeker aanraden!

2.2 Ervaring Qatar

Het beeld dat veel mensen hebben bij Qatar, een klein land dat ontzettend rijk is door olie en gas en daardoor dingen voor elkaar kan krijgen, is grotendeels waar. Ook dat het een woestijnland is met een ontzettend hoge temperatuur is grotendeels waar. Toen ik in begin september van het vliegveld

naar buiten stapte schrok ik van de golf van hitte die tegen mijn gezicht sloeg. Zelfs om acht uur ‘s avonds was de temperatuur nog boven de 35 graden. Later kom je erachter dat je er niet eens zoveel van merkt omdat je voornamelijk binnen bent in ruimtes met AC en ook omdat je er een klein beetje aan gaat wennen. Daarnaast wordt het vanaf oktober meer aangenaam en op het einde van mijn stage is het overdag tussen de 20 en 25 graden, een groot verschil dus met de meer dan 40 graden die het vaak in de zomer is! Een goede tip is dan ook om proberen de zomer te vermijden.

Het beeld van de rijkdom zie je vooral door de dure auto’s en kitscherige (Arabische) uitstraling van gebouwen en winkels. Daarnaast wordt er in een tempo gebouwen uit de grond gestampt en wegen aangelegd wat je bijna nergens in de wereld zult zien. Ook zie je de rijkdom terug in het doen en laten van de Qatari, ze hebben soms een gemakzuchtige en arrogante houding. Gemakzuchtig in dat ze vaak liever een half uur naar een parkeerplek zoeken dan vijf minuten lopen en arrogant in de zin dat ze bijvoorbeeld vaak voorrang claimen in het verkeer en rijen. Ondanks dat je hier soms boos en gefrustreerd om raakt levert het vaak vooral verbazing op.

Het leven in Qatar is vrij duur, en al helemaal als je een keer goed gaat stappen. Een biertje kost je zo 10 euro en dan moet je ook niet verbaasd zijn als je nog entree moet betalen ook. Ondanks deze hoge prijzen levert het je het vaak wel een gaaf strandfeest of chique club/bar op. Vele bezienswaardigheden of speciale dingen zijn er in Qatar niet echt. Het grootste tijdverdrijf in Qatar is dan ook rondhangen in shoppingmalls. Enkele andere dingen die ik zou aanraden is een tripje naar Dubai, een woestijnsafari, naar het strand gaan en naar de camelrace track gaan (ik ben er zelf niet geweest toen er een race was, maar zonder race is er ook al genoeg te zien).

Samengevat is het naar mijn mening vooral belangrijk om een paar leuke mensen te ontmoeten in Qatar maar net zo in elk ander land. Het maakt dan niet uit dat je in een zandbak zit. Voor bezienswaardigheden of gave dingen die er te doen zijn moet je niet naar Qatar gaan. De unieke ervaring maakt het vooral de moeite waard.

Table of Contents

3. Abbreviations

NDSQ	-	Nakilat Damen Shipyards Qatar
DSGor	-	Damen Shipyards Gorinchem
DRMS	-	Demand Response Management System
PM	-	Project Manager
PMM	-	Project Management Manual
ERP	-	Enterprise Resource Planning
IMS	-	Integrated Management System
WBS	-	Work Breakdown Structure

4. Introduction

From September until the end of December I have conducted my internship at Nakilat Damen Shipyards Qatar (NDSQ). The state of Qatar is located in the Middle East and is an absolute monarchy ruled by Emir Tamim bin Hamad al-Thani. Qatar is one of the wealthiest countries per capita in the world due to large reserves of natural gas and oil. The economy of Qatar is growing rapidly as many new industries are established. Ras Laffan industrial city is one of places where these new industries are established. The main industry in Ras Laffan is the conversion of Qatar's natural gas reserves to liquids, furthermore world's biggest port for gas transportation is located in Ras Laffan and of course Nakilat Damen Shipyards Qatar (NDSQ).

Nakilat Damen Shipyards Qatar (NDSQ) is a joint venture between the Qatari gas transport company Nakilat and the Dutch shipbuilding company Damen Shipyards. NDSQ opened for business in 2010 as being one of the new industrial economies to be added in Qatar. Jointly they operate a world-class and state-of-the-art facility capable of building ships in steel, aluminum or glass reinforced plastic with a length of up to 170m. Vessels manufactured by NDSQ feature Damen's proven shipbuilding designs and its industry-leading standards for quality in all aspects of the manufacturing process. Currently NDSQ delivered 26 vessels and 18 yacht refits and 14 projects are on-going.

The organization structure of NDSQ is a matrix structure with an overlap between the functional and operational structure. The departments I was involved with most during the internship were the operations department and production department. During my internship I had many different projects and tasks:

- Get to know the yard, the facilities, the company and its departments
- Write an new manual for the Project Management
- Conduct a data analysis
- Various smaller projects and activities

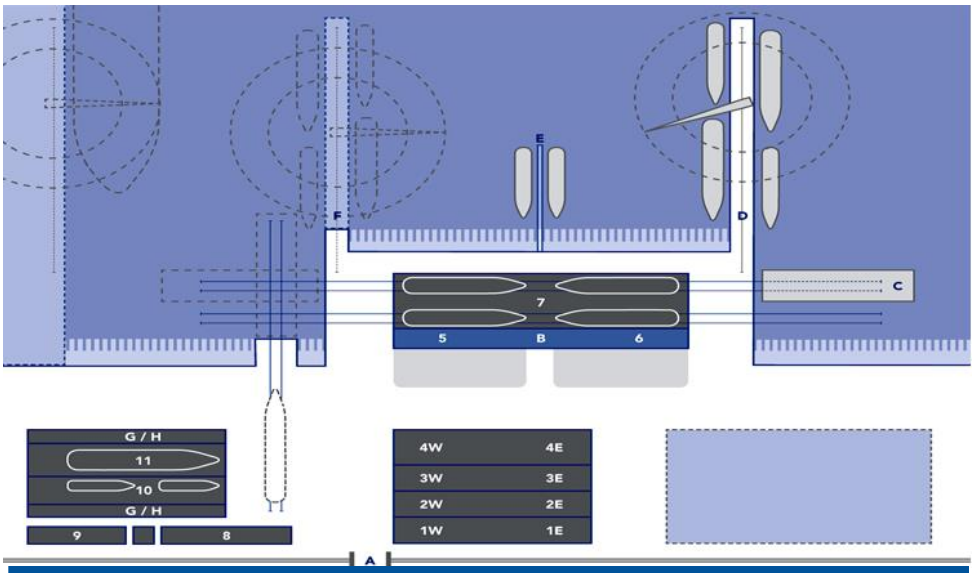
This report contains a summary about the yard, its facilities, the company and its departments. Furthermore explanation is given about the Project Management Manual and why it was important to create one. At last the process of making a data analysis and the conclusions from it are described. The smaller projects and activities are not described in this report due to their smaller significance.

5. NDSQ company and yard summary

To get a general idea about the company, the yard, its facilities and the departments these subjects are described briefly in the next paragraphs.

5.1 Yard area

The yard area consists of three main halls: an assembly hall, construction hall and yacht facilities hall. The main office is located above the construction hall. A more detailed overview is illustrated in Figure 1.



		NAKILAT DAMEN SHIPYARDS QATAR (NDSQ) RAS LAFFAN
YARD AREA	A	58818m^2
OFFICES	B	Main office including owner's representative offices
	G	Offices for yacht facilities
LAUNCHING / RECOVERY	C	Load Out & Recovery Barge with 6,250-ton lifting capacity
BERTHING	D	Fixed quay with 600m berthing length and 30-ton crane
	E	Floating jetty with 100m berthing length
	F	Fixed quay with 600m berthing length and 30-ton crane (future extension)
COVERED HALLS	1W	Pipe workshop
	1E/2E	Warehouse
	2W	Steel workshops
	3/4	Assembly and section workshops
	5/6	Outfit shops
	7	Main construction hall of L 270m x W 65m x H 35m Positions for simultaneous construction of four ships of up to 120m in length
	8	General workshop for yacht facilities
	9	Paint shop for yacht facilities
	10	Yacht outfitting hall of L 180m x W 37.5m x H 45m
	11	Yacht outfitting hall of L 180m x W 32.5m x H 35m
	H	Outfit shops and stores for yacht for yacht facilities

Figure 1: Yard area and legend

NDSQ can build ships in steel, aluminum or glass reinforced plastic of up to 170m in length for the following markets:

- Commercial
- Naval & Patrol
- Yachting
- Public transport
- Barges and Pontoons

5.2 Facilities and equipment

Because I had no experience with shipbuilding I was introduced to a variety of facilities and equipment NDSQ is using. In the next figures some of the facilities and equipment are illustrated.

Figure 4:Left: construction hall on the left and assembly hall on the right. Right: Load Out/Recovery Barge

Figure 3: Left: Self Propelled Modular Transporter. Right: ASD Tug boat

Figure 2: Left: Assembly of vessel. Right: placement of Caterpillar motor

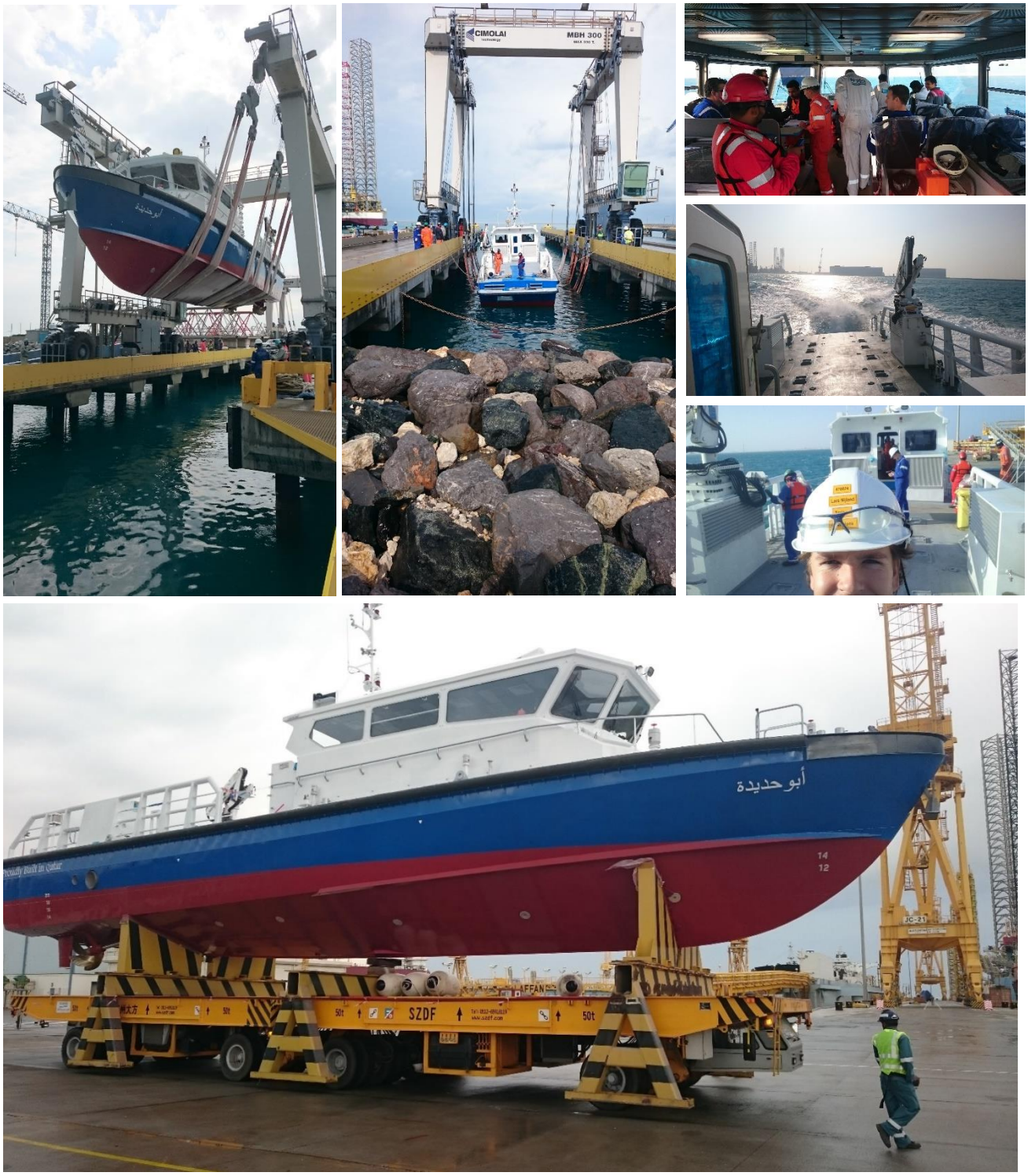


Figure 5: Launch and sea trials for a Damen Stan 2606.

The most memorable and educative moments during the internship outside the office were:

- The construction of the vessels
- The transportation of a vessel
- The launch of a vessel

- The sea trials of a vessel
- The keel laying of a vessel

Furthermore walking around on the vessels and the yard and talk to people to understand what they are working on and how they are executing their job was very interesting and educative.

5.3 The company and its departments

As mentioned in the introduction Damen's organization is build up by a matrix structure with the projects on the one side and the functional departments on the other, as described in Figure 6. In Annex A a complete chart of the organization can be found. Furthermore the different departments, functions and employee which is responsible are mentioned. The organization is split in a NDSQ part and DSGor part.

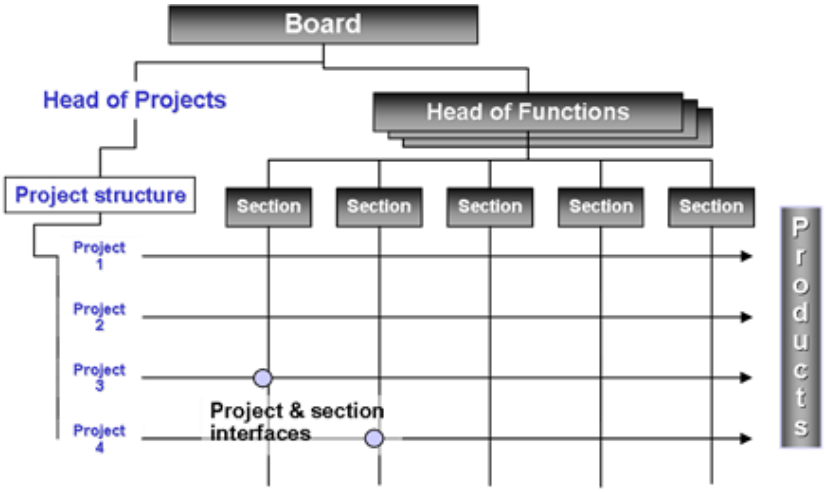


Figure 6: Example of a matrix organization.

6. Project Management Manual

In this chapter the realization of the Project Management Manual (PMM) is described and explained. Making the complete Project Management Manual was too much work to do completely in the short period of the internship. The main information, structure and visualization is created. The completion will be done by the Project Managers themselves by improvement due to usage.

6.1 Goal

As described in paragraph 0 the organization structure of NDSQ is a matrix organization, with on the one side the projects structure. Every project has an assigned project manager from NDSQ as well as DSGor. Due to the complex matrix structure and the huge physical distance between the NDSQ project manager (PM) and the DSGor project manager it is easy to make mistakes. One of the assignments therefore was to make a guiding manual for the project management in order to get distinctness in all tasks and responsibilities.

6.2 Methods and justifications

In order to create the PMM information had to be gathered, structured and visualized in a way it becomes a workable and clear manual. In the next paragraphs the methods and justifications are described for creating the manual.

6.2.1 Information gathering

Both NDSQ and DSGor have an extensive knowledgebase with procedures, information and manuals. Writing a complete new manual therefore was unnecessary as there was a lot of information already available. DSGor already has an interactive Project Management Manual in there online management system from which most tasks and explanation could be extracted. Also NDSQ had procedures available which could be used. The information not available was found by interviewing the Project Manager or employees from other responsible departments.

6.2.2 Information structuring

After the overload of information a way for structuring this information had to be found. During a project there are key processes which should be constantly monitored and updated from the beginning until the end of a project and there a number of distinguishable phases within a project. These key processes and phases are broadly the same as in the Project Management Manual of DSGor nevertheless there are some differences. DSGor distinguishes budget, organization, risk, quality, information and time as key processes. Although the appellation is somewhat different, as can be seen in Figure 7, the key processes are broadly the same. The reason for the different appellation is that these terms are more broadly used within NDSQ. We choose to exclude the organization process for the reason that this process is already widely documented in different other procedures and organization charts. Information is left out considering that each phase requires certain information and thus it is described within the phases. Material Control is included as a result of the complexity of the material coordination and logistics. Most materials come from oversea and therefore have to travel long distances and furthermore have to go through the strict and time-consuming Qatar customs. The lead time of materials is therefore is quite long. Likewise the procurement process is vastly more complex compared to the Dutch counterpart. To contribute to Qatar's economy the government obligated companies to favor doing business with local suppliers and companies. Considering Qatar is a small country and does not have an extensive shipbuilding sector, doing business with local suppliers and companies is not always possible. Every time NDQS

therefore chooses to get materials from DSGor or other companies abroad, a document has to be prepared with prove that there is no other possibility than outsourcing.

The distinguished phases during a project are chosen to be the same as DSGor with the exception of Project Execution. Within DSGor this phase is called building phase and contains four sub-phases: engineering, purchase, material control and construction. NDSQ outsources the engineering to DSGor and thus this phase is not executed. Furthermore purchase and material control are included in the key processes as these processes are far more complex for NDSQ and therefore need to be monitored and checked during the complete project. Combining the key processes and distinguishable phases will give a matrix structure like Figure 7.

The key processes during a project are:

- Cost Control
- Material Control
- Procurement Execution
- Quality Assurance
- Planning
- Risk assessment

The distinguished phases during a project are:

1. Pre-contract & Sales
2. Start-Up
3. Kick-Off
4. Project Execution
5. Launching
6. Delivery
7. Closure

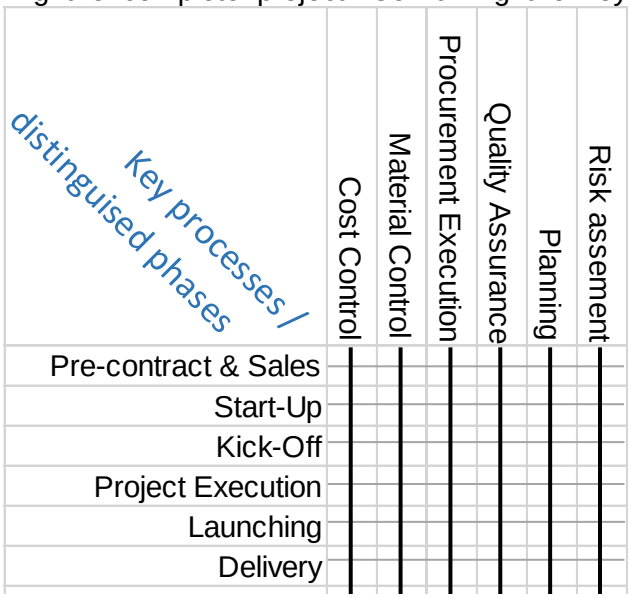


Figure 7: Matrix structure of key processes and distinguishable phases

For every phase a standard structure is included containing the process flow, the description of the phase and the documents and activities which have to be created or executed. When the process is followed according to the process flow and all activities are done and all documents are created the phase is considered to be finished. The Project Manager from NDSQ and I tried to eliminate all activities and documents which are never done or used in order to make a clear and useful manual. In the future the manual will be updated and changed in cooperation with the PM from DSGor in order to make it complete and without unnecessary content.

6.2.3 Information visualization

Now the structure of the information is determined a proper way to visualize the information is to be determined. Considering that the information is divided in key processes and phases which overlap a written manual is not a good choice due to the constant need for switching between the two. It was therefore decided that an interactive manual was needed in order to be able to switch swiftly between the phases and key processes and additionally contained an easy search function. In discussion with the IT department we concluded

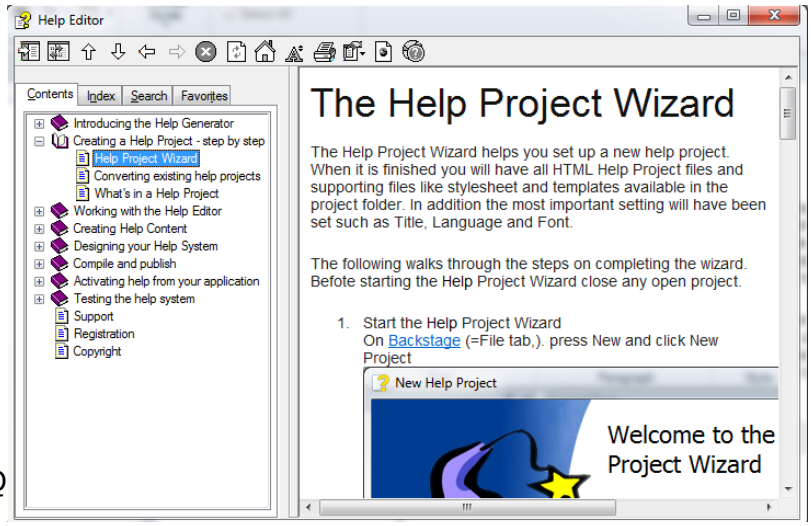


Figure 8: Example of Help file

that a HTML help file (like Figure 8) is very easy to use and satisfies the demands mentioned earlier.

NDSQ already uses a Demand Response Management System (DRMS) which contains all procedures, manuals, and other documentation. An extra advantage of using a help file is that it was easy to integrate in the DRMS.

In Annex B the structure of the file can be found. In Annex C the help-file in its latest form is converted to a Word file. The manual already contains 69 pages when converted to a Word file and therefore confirms that it not an ideal to use as a printed manual.

6.3 Conclusions and recommendations

Although the first steps are done in making a Project Management manual it is difficult to make it right first time. There is so much information available and it is difficult to make an estimation about what is really needed and in which way. However the content is not complete and sufficient yet, the structure of the manual and the tool is determined. The help file makes sure, when completely correctly designed and structured, that subjects are easy to be found, there is a search function and there is an easy way to browse its content. As it is available in the DRMS every PM can easily open it and use it. During each phase there are checklists for documents and activities which have to be done as well as the process flow. When the content is completed and everything is done according to the manual (hopefully) no mistakes will be made and nothing will be forgotten.

In order to make sure the content will be completed and updated, there was decided that the Project Management Manual will be used with the next new project(s) so both PM from NDSQ and DSGor can improve it by usage. The manual will be checked and used during the project so it can be changed and updated where necessary.

7. Data analysis

7.1 Introduction

In this chapter a data analysis is conducted to gather information needed to figure out if the organization structure for project teams should be changed. Before the goal of this change in the project teams will be explained, first an introduction about some of the software tools and management tools is given that NDSQ uses to support the company.

7.1.1 Integrated Management System

NDSQ is using an Integrated Management System to integrate all of the organization's systems, resources and processes in to one complete framework. The software program used is SAP ERP (enterprise resource planning) and contains different modules to cover the processes and resources within the company. Data input is used to create databases and automate processes. The data gathered throughout the years, by the SAP ERP system, can also be used for analysis. The data stored in the system was the basis for the analysis done.

Figure 9: SAP ERP system and the different modules

7.1.2 Production planning

The production planning of vessels within the yard is done on different levels (Work Breakdown Structure of the planning). First of all there is the yard level (Level 0, an example can be seen in Figure 10). As there is a maximum capacity of facilities and workforce the planned production cannot exceed the capacity. Based on the capacity of the yard, the demands of the client and historic data a production period of a certain type of vessel will be determined.

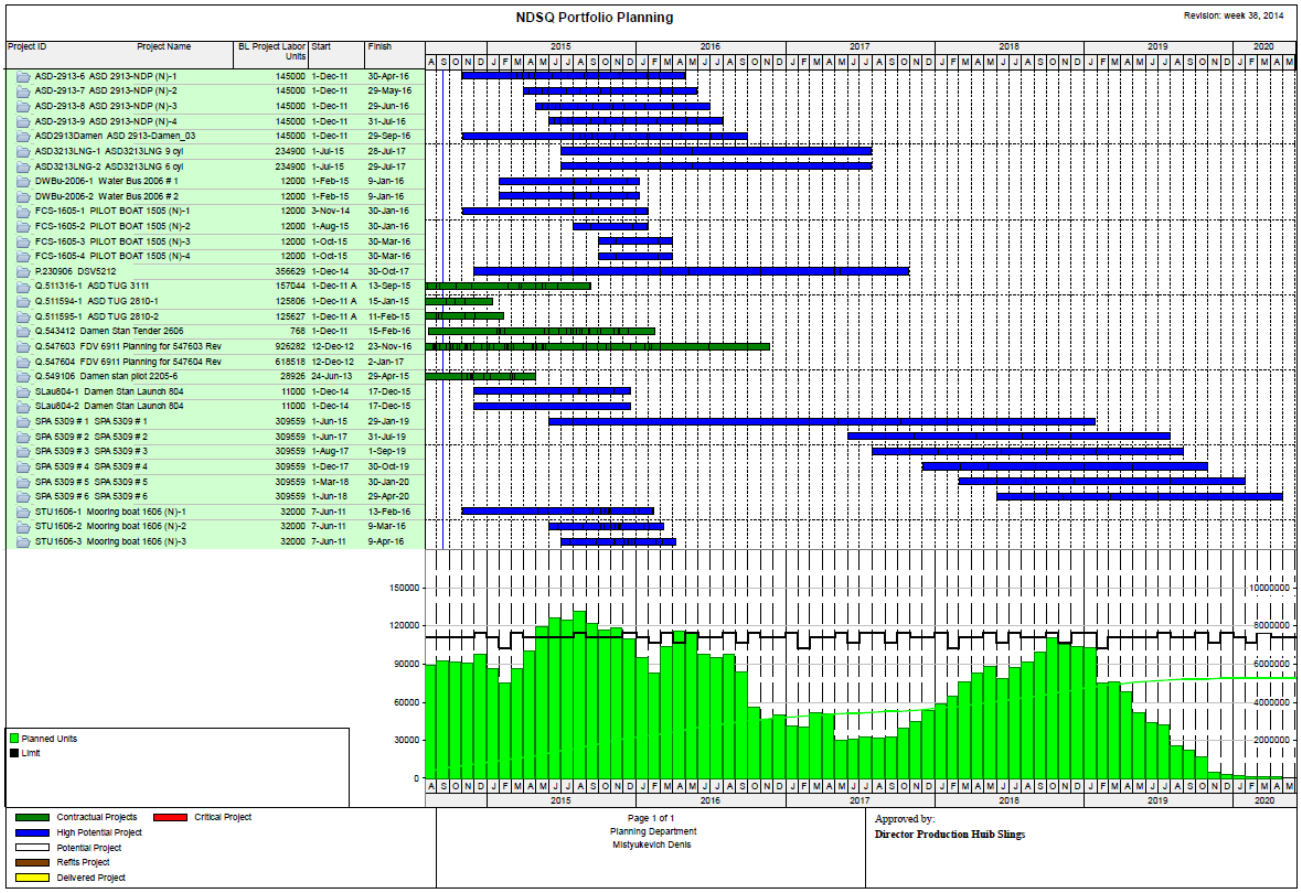


Figure 10: example of portfolio planning

Level 1 is project production planning summary. Within the complete production period major elements are mentioned to make the planning more detailed.

Level 2 is the “Production base planning” and should be in accordance with the Building Strategy and its Work Breakdown Structure of a project. In this planning also the key milestones are mentioned and the time frame for all main building phases.

Level 3 planning is based on approved Building Strategy and budget distribution. The planning should be consists of durations, start dates and finish dates for each activity, resources (Work-Centers) and budget.

The planning is based on an amount of hours needed over a certain period. For example level 1 planning will describe the complete amount of hours available in the yard. Level 2 planning will describe the amount of hours to complete milestone planning within a project. Level 3 planning will describe the amount of hours needed to complete an activity.

7.1.3 Building Strategy

The Work Breakdown Structure is buildup by a hierarchical structure of drawings and sub-drawings needed to produce a vessel. The planning of the production is connected to this structure. Activities, materials and resources are linked to the Work Breakdown Structure. The planning, drawings and materials and resources needed are all linked to each other in order to successfully and logically complete a project.

7.1.4 Production progress

The project progress is tracked in by comparing the planned amount of hours, the actual amount of hours spend, and the actual progress of production. Of course spend hours and actual progress should be in line with the planning. Ultimately there is created a planning with a low amount of hours and the hours spend and the actual progress exactly follow this planning. The project is then perfectly balanced. In reality this of course almost never happens and thus constantly one of the three “pillars” should be intervened to create balance again.
The three options to balance production again are: adapt the planning, spend more/less hours, increase/decrease production progress.

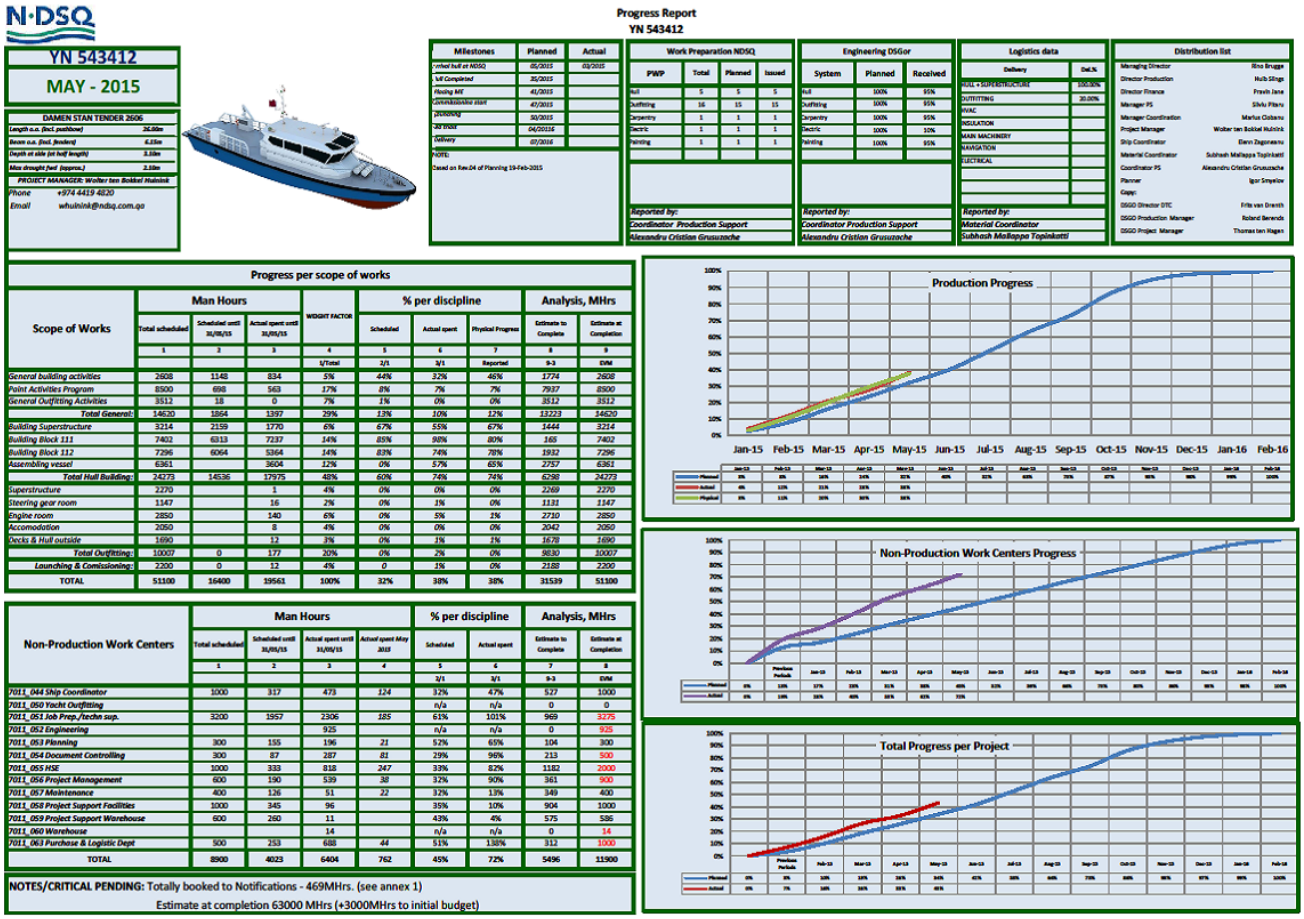


Figure 11: example of progress report

7.1.5 Summary

Planning, building strategy and production progress are all linked to each other in order to successfully complete a project. Balancing these processes is complex due to the many factors which can influence them. It is therefore critical that these processes are constantly updated and balanced.

7.2 Data analysis

The SAP system contains data from 2012 when NDSQ started to use SAP until now. For every employee hours are submitted on a certain activity, because one employee can work on multiple activities in one day, the database contains more than 1 million lines of data. Although the data,

especially in the earlier years, is not without mistakes it can give a pretty could insight in what is going on in the shipyard. An example of a few lines of data can be found in Annex D

7.2.1 Goal

Because the database contained such vast amounts of information, first a goal needed to be determined in order to create useful visualizations of the dataset. The presumption within NDSQ was that for the reason that there is no real dedicated team for a project, the projects suffer from lack of communication, knowledge and efficiency. NDSQ therefore tries to create (partial) dedicated teams for a project. In this way employees can work on only one project or project-group. The assumption when working with dedicated teams is that there will be:

- Less time lost due to unnecessary personnel movement (personnel stays on the same project, rather than move between different projects)
- Less rework (teams communicate more and failures and mistakes are detected earlier)
- Less unnecessary material movement (material can stay on the same project)
- Less engineering failures (teams communicate more and failures and mistakes are detected earlier)
- Better team work for the reason that the team will learn to anticipate on other team members and help each other

Before something can be stated about dedicated teams the current situation has to be reviewed first. One of the tools to gain understanding about the current situation is using SAP data. This is done in different steps:

1. Determine whether dedicated teams should be considered only for new build or new build and repair/refit jobs

A repair/refit project is different every time, therefore it is harder to determine the amount of personnel needed for the project. New build projects are often already produced for a different client or a comparable vessel already is produced which makes it easier to determine the amount of personnel needed. When the hours for refit/repair jobs are less than 10% of the total hours it is decided to not consider them.

2. Determine the number of people who have submitted hours on a project for different periods of time

The number of people who have submitted hours on a project gives an indication about if the current situation, when the number of people working on a single project is significantly higher than the hours consumed divided by a full working period dedicated teams can provide better results. This will be explained more extensively in paragraph 7.2.3.

3. Determine the number of people of every department who have submitted hours on a project for different periods of time

There is much difference between the departments as for some departments working on multiple projects is more customary then for others. Supporting departments for example are often working on multiple projects while this is less common for the outfitting department. Further explanation can be found in paragraph 7.2.4.

4. Determine the average of hours per day submitted by one single person on a project

With dedicated teams each member works a full day on the same project. To determine the current situation the daily average amount of hours on single project is determined. More information can be found in paragraph 7.2.5.

5. Determine the percentage for submitted hours per day on a single project

The percentage for submitted hours per day on a single project gives insight in what the usual daily number submitted hours for a project are. When this number nears 8 people nearly always work a full day on the same project. More details can be found in paragraph 7.2.5

6. Determine the number of projects a single employee submitted hours for per month

Most projects take at least a year from beginning to end. Most departments are working multiple months on the same project. The determination of the number of projects employees submitted hours for gives a good insight if a dedicated team can bring this number down. Further details can be found in paragraph 7.2.6.

7.2.2 New Build/Refits

Until September 2015 there are 3816765 hours submitted for new build projects and only 181299 for repair/refit jobs. As the hour consummation for repair/refit jobs is only a very small part of the total hours it was decided that repair/refit jobs are not considered in the data analysis. More data about repair/refit jobs can be found in Annex E.

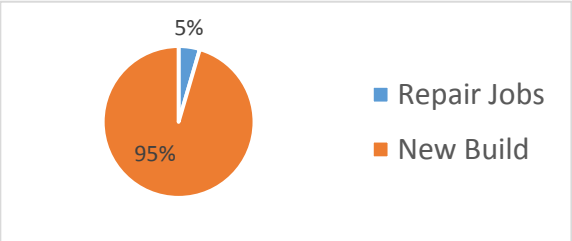


Figure 12: Percentage of New Build vs. Repair/refit jobs

7.2.3 Number of people per project

Counting the number of people who have submitted hours on a project was the next step in drawing conclusions about the formation of dedicated teams. The number of people is divided in NDSQ employees and subcontractors. The complete chart of all new builds can be found in Annex F. The outcome of these results were in almost every project quite shocking as the number of people who have submitted hours on a project was way higher than expected. I will explain this with two examples:

Two of the most time consuming projects are two megayachts of 70 meters. These projects started in 2014. On the FDV 6911- Al Jassasiya 1 (the first of the two 70 meter yachts) 901 people wrote hours on this project while NDSQ only had 1073 people in total who have submitted hours on projects during 2014 and 2015. The monthly average of employees who have submitted hours in 2014 and 2015 was around 630. In some months almost 500 different employees worked on the FDV 6911- Al Jassasiya 1. For the FDV 6911- Al Jassasiya 2 this is a little less but still very high.

		2014												2015										Total
	Network	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	
FDV 6911 - Al Jassasiya 1	Q.547603	25	36	183	235	322	389	372	427	487	460	490	500	496	470	471	486	516	489	407	401	439	356	901
FDV 6911 - Al Jassasiya 2	Q.547604	17	17	153	210	279	345	326	393	455	423	485	482	471	456	449	440	479	405	413	373	418	339	855

Figure 13: Number of different employees who have submitted hours for the projects FDV 6911 monthly and in total

Also for a smaller boat like the Damen Stan Pilot 2205 (22.8 meter) the number of people who have submitted hours was way higher than expected. There are months where more than 200 people have submitted hours for a Stan Pilot 2205 project. Because the number of people who have submitted hours was almost always higher than expected further research was needed to gain insight about why this was the case.

		2013												2014											Total
	Network	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Damen Stan Pilot 2205-2	Q.549102						19	27	42	54	75	95	151	171	220	158	117	105	78	71	5					408
Damen Stan Pilot 2205-3	Q.549103						14	21	12	42	54	71	138	162	218	137	125	125	66	71	5					389
Damen Stan Pilot 2205-4	Q.549104							2	5	25	49	41	109	136	148	157	144	151	136	96	28					375
Damen Stan Pilot 2205-5	Q.549105							2	3	16	40	34	86	126	138	161	155	148	128	72	31	1				365

Figure 14: Number of different employees who have submitted hours for the projects Stan Pilot 2205 monthly and in total more extensive information can be found in Annex D

7.2.4 Number of people per department per project

When the people writing hours on a project are split in departments, a more detailed image can be found. For the example of the FDV 6911 now the people submitted hours from a certain department are described. The departments with the most people are hull, outfitting and supporting departments.

	Carpentry	Electrical	Hull	Other	Outfitting	Painting	Proj. Man.	Ship. Coord	Supp. Dep.	Grand Total
FDV 6911 - Al Jassasiya 1	44	44	239	69	173	78	8	12	266	901
FDV 6911 - Al Jassasiya 2	41	33	238	54	175	81	10	11	237	855

Figure 15: Number of different employees who have submitted hours for the projects FDV 6911 per department and in total more extensive information can be found in Annex F

For the Stan Pilot 2205 vessels outfitting, painting and supporting departments are the departments with the most people.

	Carpentry	Electrical	Hull	Other	Outfitting	Painting	Proj. Man.	Ship. Coord	Supp. Dep.	Grand Total
Damen Stan Pilot 2205-2	17	20	47	26	104	88	2	1	113	407
Damen Stan Pilot 2205-3	14	20	41	22	100	87	3	2	109	389
Damen Stan Pilot 2205-4	18	21	41	24	105	76	2	2	91	371
Damen Stan Pilot 2205-5	18	23	34	23	108	76	2	2	85	360

Figure 16: Number of different employees who have submitted hours for the projects Stan Pilot 2205 per department and in total more extensive information can be found in Annex F

The numbers mentioned in Figure 15 and Figure 16 do not give that much useful information as it is not clear how it could have been. From now only the carpentry, electrical, hull, outfitting and painting department are considered as the other departments are supporting departments and for them it is necessary to work on multiple projects at the same time.

For the next figure only an example of the FDV 6911-1 is used considering the scale of the table when all examples are mentioned. In this figure the total amount of hours consumed monthly per department, the number of people submitted hours monthly per department, the number of people who could have submitted hours when a 160 hour month was considered and the deviation percentage compared to the real case. This gives really interesting insight considering dedicated teams. For example in month 6 year 2015 for the carpentry department 19 people submitted hours on the project while only 7 people should have submitted hours when they submitted a full 160 hour month on the project. The higher the deviation percentage the less people could have submitted hours on the project. As can be seen most of the time less than half of the people could have submitted hours on the project. There is only one exception in with a negative deviation percentage: this exception can be explained that in that month the electrical department made a considerable amount of overtime. The number of people with a full 160 hour month is determined by dividing the total monthly number of hours with 160.

Q.547603		Carpentry				Electrical				Hull				Outfitting				Painting			
Year	MonthNr	Sum of Number	Distinct Count of Pers.No.	With 160 hour month	Deviation percentage	Sum of Number	Distinct Count of Pers.No.	With 160 hour month	Deviation percentage	Sum of Number	Distinct Count of Pers.No.	With 160 hour month	Deviation percentage	Sum of Number	Distinct Count of Pers.No.	With 160 hour month	Deviation percentage	Sum of Number	Distinct Count of Pers.No.	With 160 hour month	Deviation percentage
2014	1																	1	1	0,0	100%
	2																	1	1	0,0	100%
	3									5089	74	31,8	57%	537	20	3,4	83%	504	21	3,1	85%
	4									6526	83	40,8	51%	890	38	5,6	85%	686	15	4,3	71%
	5	56	2	0,4	83%					7537	112	47,1	58%	1555	54	9,7	82%	488	19	3,1	84%
	6	160	4	1,0	75%					8892	134	55,6	59%	3476	76	21,7	71%	1090	41	6,8	83%
	7									7669	126	47,9	62%	3594	80	22,5	72%	587	32	3,7	89%
	8					1	1	0,0	99%	13406	170	83,8	51%	6469	97	40,4	58%	1220	40	7,6	81%
	9	200	3	1,3	58%	11	2	0,1	97%	14220	178	88,9	50%	8319	106	52,0	51%	2100	47	13,1	72%
	10	288	7	1,8	74%	4	1	0,0	98%	12439	144	77,7	46%	9352	102	58,5	43%	2537	46	15,9	66%
	11	360	9	2,3	75%	24	1	0,2	85%	19522	190	122,0	36%	11663	121	72,9	40%	2843	52	17,8	66%
	12	590	13	3,7	72%	33	3	0,2	93%	20393	186	127,5	31%	11412	115	71,3	38%	3723	50	23,3	53%
2015	1	680	13	4,3	67%	178	6	1,1	81%	18129	179	113,3	37%	11640	118	72,8	38%	3534	52	22,1	58%
	2	204	6	1,3	79%	76	7	0,5	93%	14895	167	93,1	44%	10356	113	64,7	43%	2983	47	18,6	60%
	3	314	7	2,0	72%	52	6	0,3	95%	15014	163	93,8	42%	11028	112	68,9	38%	2723	41	17,0	58%
	4	1031	13	6,4	50%	153	6	1,0	84%	16374	158	102,3	35%	12184	107	76,2	29%	2445	39	15,3	61%
	5	1689	20	10,6	47%	1650	16	10,3	36%	14447	152	90,3	41%	11334	112	70,8	37%	3213	45	20,1	55%
	6	1143	19	7,1	62%	1526	12	9,5	21%	8749	110	54,7	50%	8277	108	51,7	52%	3000	41	18,7	54%
	7	2106	23	13,2	43%	1596	12	10,0	17%	9563	119	59,8	50%	8852	108	55,3	49%	3295	45	20,6	54%
	8	1498	21	9,4	55%	2362	11	14,8	-34%	12252	101	76,6	24%	8993	98	56,2	43%	3694	39	23,1	41%
	9	3933	32	24,6	23%	3072	20	19,2	4%	8784	95	54,9	42%	7173	87	44,8	48%	3596	34	22,5	34%
	10	1930	30	12,1	60%	2590	18	16,2	10%	5873	90	36,7	59%	3950	74	24,7	67%	1817	37	11,4	69%

Figure 17: Real number of people worked on the FDV 6911-1 compared with the number of people when a full 160 hour month is considered. The higher the dev. percentage the less people could have submitted hours on the project when a 160 hour month is considered.

7.2.5 Average hours submitted daily on a project per department

Another way to determine whether employees work on a single project daily is determining the average of hours submitted on a single project per day. If a dedicated team for a project will be created it means that a person should write a full day (8 hours) on a project during the time this person is involved with the project. A normal working day is 8 hours so it can be concluded that for every department the average submitted hours on a project is way below 8 hours. This means that often people are working on more projects a day. Although this is not necessarily a bad thing, as for example a painter sometimes has multiple small activities on day and thus can work on different projects, it does not fit in the philosophy dedicated teams are more efficient. For the grey departments it is less important to include them in dedicated teams as these departments are supporting multiple projects.

Department	2012	2013	2014	2015	Grand Total
Carpentry	6,8	7,4	6,3	5,8	6,5
Electrical	6,4	6,8	6,0	6,8	6,5
Hull	6,1	7,2	6,4	5,8	6,3
Outfitting	6,3	6,3	5,5	5,0	5,7
Painting	3,6	5,0	4,4	4,4	4,5
Project Management	6,5	2,3	2,2	2,7	2,6
Ship Coordination		3,1	3,4	4,7	4,0
Supporting departments	5,5	2,5	2,4	2,5	2,6
Other	5,7	5,9	4,9	5,0	5,2

Figure 18: average amount of hours submitted on a single project per day

7.2.6 Percentage of the number of hours submitted

In the next table the percentage of times a certain amount of hours is submitted is described. As can be seen, most of the time 8 hours are submitted so this means a full working day was spent at the same project. The painting department and outfitting department more often spend less than a full working day on a project. Furthermore a significant percentage submit 2 hours a day on a project. In some circumstances there is no other possibility than only spend two hours on a project, nevertheless when creating dedicated teams this should be avoided.

Count of Submit.Hrs	Submit.Hrs														
Department	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**16**
Carpentry	0.3%	16.8%	1.0%	5.1%	0.2%	7.2%	0.1%	67.8%			0.1%				
Electrical	0.9%	12.6%	2.0%	6.9%	0.3%	7.5%	0.1%	68.0%	0.0%	0.1%	0.0%				
Hull	1.2%	18.2%	1.1%	6.2%	0.4%	6.3%	0.9%	64.7%		0.0%	0.0%				
Outfitting	3.8%	21.0%	3.8%	10.4%	1.0%	6.2%	0.3%	52.7%	0.0%	0.1%	0.0%			0.0%	
Painting	4.7%	28.2%	6.4%	10.3%	2.3%	4.6%	0.5%	34.6%	0.0%	0.8%	0.2%	0.0%	0.0%	0.0%	0.0%
Other	6.3%	12.6%	5.5%	18.8%	0.6%	5.2%	1.0%	43.8%		0.0%	0.0%	0.0%			
Project Management	26.1%	23.9%	9.4%	20.8%	0.6%	1.0%	0.2%	8.2%							
Ship Coordination	14.6%	22.9%	11.1%	20.4%	1.2%	3.7%	0.6%	24.0%				0.0%			
Supporting departments	35.6%	28.0%	9.9%	12.1%	1.4%	2.1%	1.0%	7.6%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	
Grand Total	8.6%	21.7%	4.3%	9.5%	1.0%	5.3%	0.7%	46.5%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%

Figure 19: percentage of times when X amount of hours are submitted

One of the conclusions from the figures illustrated before is that employees often work on multiple projects during a day. When creating dedicated teams an employee should work on only one project a day and even most of the times even one project a month or multiple months as most projects take more than 8 months from start to finish. In the next figure the number of employees during a month is counted for the number of projects they worked on. The grey departments mentioned in earlier figures are excluded because for these departments no dedicated teams will be created.

#Employees who worked on X projects	2012												2013												2014												2015									
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10
1	95	110	56	47	79	75	80	93	80	62	47	64	71	97	81	77	75	97	80	72	64	98	67	85	64	81	43	28	48	33	81	70	42	132	67	84	74	100	89	106	64	63	90	97	126	105
2	50	40	83	99	79	75	133	112	123	138	119	158	142	122	125	148	137	120	146	115	118	142	160	136	136	100	87	119	111	120	127	154	165	155	210	188	171	164	177	202	200	176	166	157	144	147
3	36	36	52	49	56	74	77	104	87	91	111	85	97	96	79	57	71	65	84	100	78	93	70	78	68	66	86	76	110	119	95	113	131	109	119	129	153	120	111	94	85	90	84	63	65	67
4	14	28	30	23	27	39	33	56	43	58	62	63	55	55	70	58	70	82	76	73	70	54	90	66	71	78	99	87	74	68	54	46	66	25	38	44	33	43	39	34	49	41	45	51	49	56
5	6	18	17	16	30	15	28	26	38	36	44	37	31	28	32	43	51	56	53	35	41	36	49	40	33	41	50	31	34	40	39	57	63	51	40	20	16	18	21	9	24	24	19	32	27	22
6	7	10	15	17	21	14	4	15	18	20	35	16	23	18	15	20	23	36	35	23	18	26	22	20	12	24	26	21	25	34	17	11	1		4	1	3		4	16	16	16	18	18	13
7	2	3	8	10	6	8	2	1	11	15	8	9	18	15	12	15	12	12	22	14	17	22	17	11	19	16	18	11	16	12	24	7					1		4	10	12	10	8	9	14
8			2	3	1	2	1	4	3	10	10	3	3	6	5	6	3	9	6	7	13	10	5	10	12	15	6	14	7	10	7								2	3	9	3	8	13	7
9				1		1		2	4	3	2	3	1		3		4	4		4	6	6	6		4	6	1	3	10	4	2	3							3	4	4	7	3	2	5
10								1				2		1				2	2	1	1	4	3	3	5	3	5	2	7	4	1									1	5	12	6	5	2	4
11												1						4	1	1	2	3	1	7	2	3	3		3	1	2									2	5	3	2			
12																									3	3	5	3	1												2				
13																									3	1	2	6																	
Total #Employees who have submitted hours per month	210	245	263	265	299	303	358	413	408	433	438	441	441	438	422	424	446	487	505	445	428	494	490	456	432	437	431	401	446	445	449	461	468	472	478	466	451	445	437	461	467	450	448	442	455	440

Figure 20: #Employees who submitted hours on X projects (only the departments: hull, outfitting, electrical, painting and carpentry are included)

Percentage of of total #employees per month who worked on X projects	
1	19%
2	32%
3	20%
4	13%
5	8%
6	4%
7	3%
8	2%
9	1%
10	1%
11	1%
12	1%
13	1%

Figure 21: Percentage of total #employees who submitted hours per month on X projects (only the departments: hull, outfitting, electrical, painting and carpentry are included)

As can be seen employees often work on multiple projects a month. For example in April 2014 6 employees of the 401 in total worked on 13(!) different projects. When the figure is changed to an overall average monthly percentage, it can be seen that only 19% of the employees worked on only one project during a month.

7.2.7 Conclusions and recommendations

The data analysis was used as a tool to get some insight in the current situation. In the current situation employees often work on multiple projects in the same month and even the same day. When dedicated teams are considered in some cases for some departments less than half of the people currently submitting hours on a project could be submitting hours. Although the presumption that dedicated teams will work more efficient due to the reasons mentioned in 7.2.1 only implementing it in reality can deliver real proof. The data from the current situation and data from a certain period after the implementation of dedicated teams should be compared to draw final conclusions.

In figure 16 the number of employees submitted hours on the FDV 6911-1 are mentioned as well as the number of employees who could have submitted hours when they worked a full month. This figure can be made more for every project so far, and even more extensive and detailed when weeks are considered instead of months. For future comparable projects there can be estimated weekly, using historical SAP data, how many employees per department should work on the project. Using SAP data for creating dedicated teams thus can be very useful. Although using SAP data can be useful a few things should be considered:

- It is not clear how reliable the data is as hours are relocated sometimes to satisfy given budgets, so SAP data cannot be decisive
- Every department should be involved when the exact formation of a dedicated team is created in order to make sure everyone agrees with the formation
- Every department should stand behind the idea of dedicated teams
- The structure of planning, work breakdown structure and building strategy should be adapted to the new way of using dedicated teams
- Extra trainings are needed in order to make full use of the new way of using dedicated teams

When the new structure of using dedicated teams is introduced, SAP data can be used for management and head of departments to plan, do, act and check. Dashboards with useful data from SAP especially created for the different layers of management can help to support their function and responsibilities. An example of a dashboard can be found in Annex G. This interactive dashboard, created with Power View in Microsoft Excel, is an example of an interactive way of easily visualize helpful data for the management.

ANNEX A.

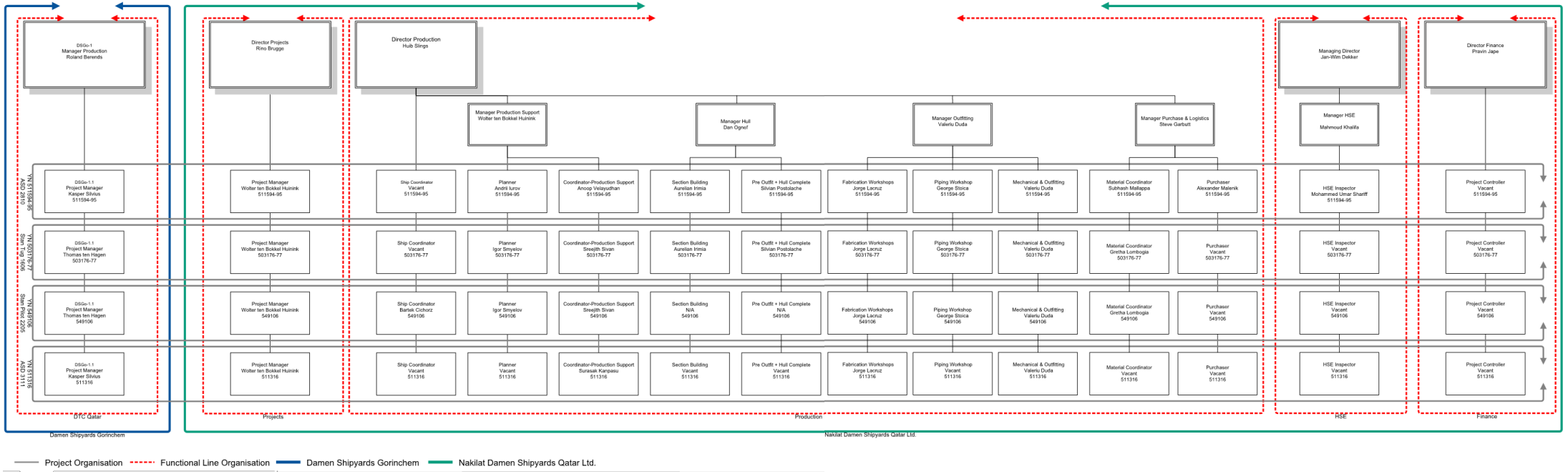


Figure 22: NDSQ organizational chart with matrix structure from June 2015.

ANNEX B.

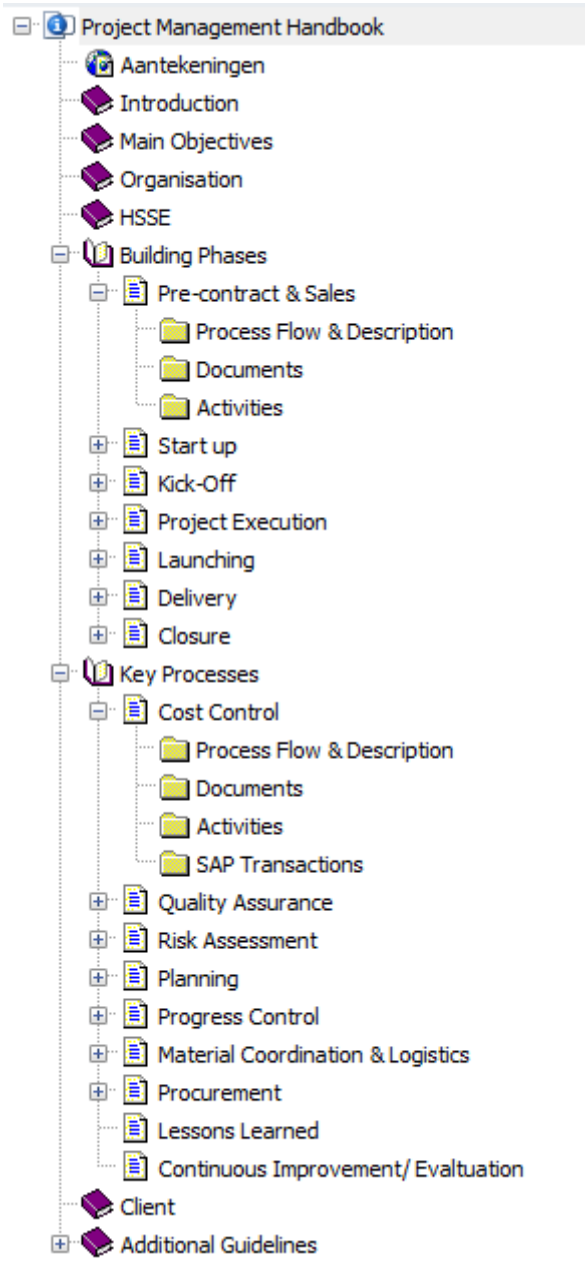
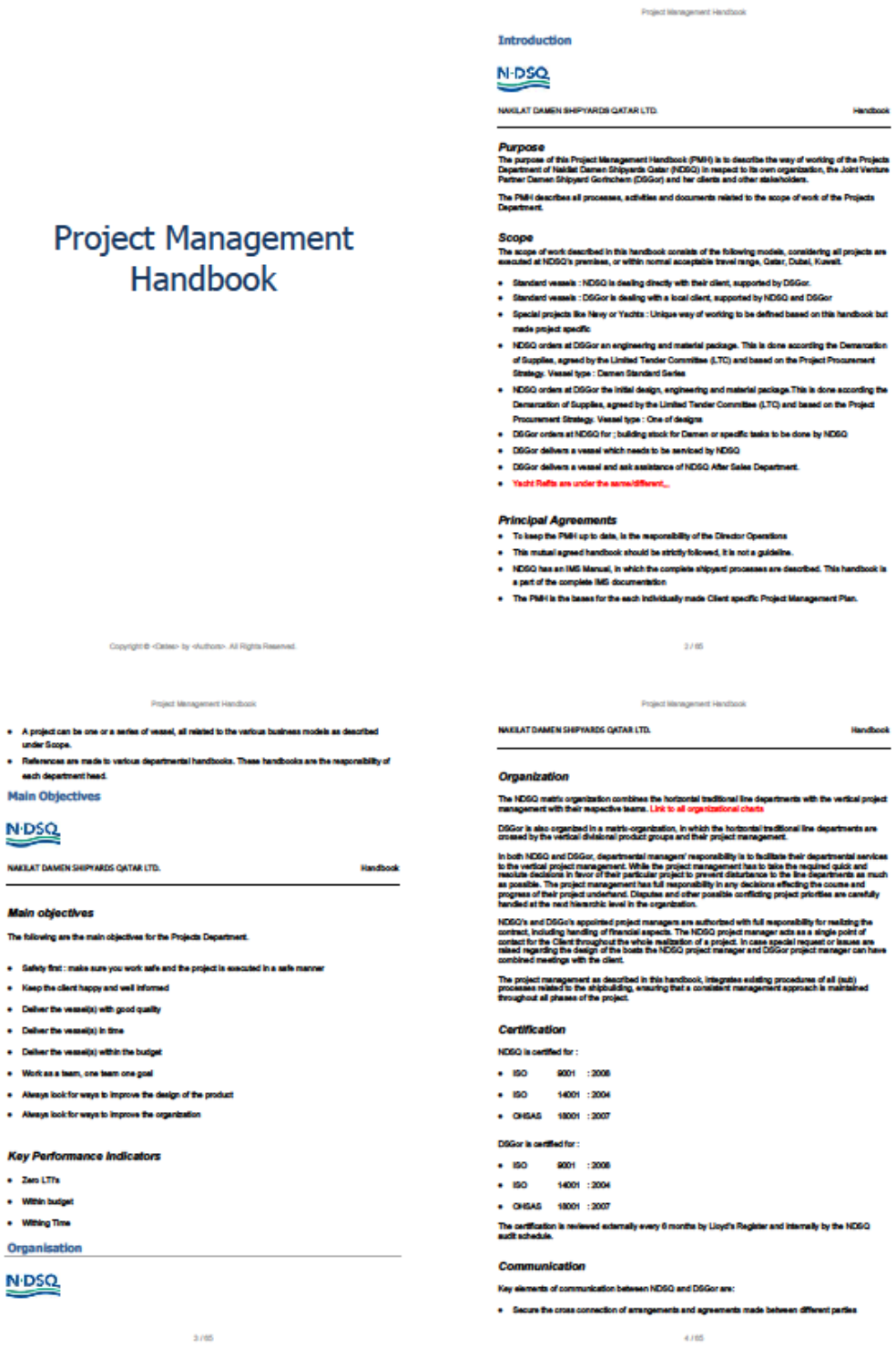


Figure 23: Structure of Project Management Manual. The manual is already online and being used in the DRMS system of NDSQ, because this is a secured environment it is not possible to share.

ANNEX C.



Project Management Handbook

Project Management Handbook

Introduction

N·DSQ

NAKILAT DAMEN SHIPYARDS QATAR LTD. Handbook

Purpose

The purpose of this Project Management Handbook (PMH) is to describe the way of working of the Projects Department of Nakilat Damen Shipyards Qatar (NDSQ) in respect to its own organization, the Joint Venture Partner Damen Shipyard Gorinchem (DSGor) and her clients and other stakeholders.

The PMH describes all processes, activities and documents related to the scope of work of the Projects Department.

Scope

The scope of work described in this handbook consists of the following models, considering all projects are executed at NDSQ's premises, or within normal acceptable travel range, Qatar, Dubai, Kuwait.

- Standard vessels : NDSQ is dealing directly with their client, supported by DSGor.
- Standard vessels : DSGor is dealing with a local client, supported by NDSQ and DSGor
- Special projects like Navy or Yachts : Unique way of working to be defined based on this handbook but made project specific
- NDSQ orders at DSGor an engineering and material package. This is done according the Demarcation of Supplies, agreed by the Limited Tender Committee (LTC) and based on the Project Procurement Strategy. Vessel type : Damen Standard Series
- NDSQ orders at DSGor the initial design, engineering and material package.This is done according the Demarcation of Supplies, agreed by the Limited Tender Committee (LTC) and based on the Project Procurement Strategy. Vessel type : One of designs
- DSGor orders at NDSQ for ; building stock for Damen or specific tasks to be done by NDSQ
- DSGor delivers a vessel which needs to be serviced by NDSQ
- DSGor delivers a vessel and ask assistance of NDSQ After Sales Department.
- Yacht Refits are under the same/different,..

Principal Agreements

- To keep the PMH up to date, is the responsibility of the Director Operations
- This mutual agreed handbook should be strictly followed, it is not a guideline.
- NDSQ has an IMS Manual, in which the complete shipyard processes are described. This handbook is a part of the complete IMS documentation
- The PMH is the bases for the each individually made Client specific Project Management Plan.

Copyright © <Dates> by <Authors>. All Rights Reserved. 2 / 65

Project Management Handbook

- A project can be one or a series of vessel, all related to the various business models as described under Scope.
- References are made to various departmental handbooks. These handbooks are the responsibility of each department head.

Main Objectives

N·DSQ

NAKILAT DAMEN SHIPYARDS QATAR LTD. Handbook

Main objectives

The following are the main objectives for the Projects Department.

- Safety first : make sure you work safe and the project is executed in a safe manner
- Keep the client happy and well informed
- Deliver the vessel(s) with good quality
- Deliver the vessel(s) in time
- Deliver the vessel(s) within the budget
- Work as a team, one team one goal
- Always look for ways to improve the design of the product
- Always look for ways to improve the organization

Key Performance Indicators

- Zero LTI's
- Within budget
- Within Time

Organisation

N·DSQ

3 / 65

Project Management Handbook

NAKILAT DAMEN SHIPYARDS QATAR LTD. Handbook

Organization

The NDSQ matrix organization combines the horizontal traditional line departments with the vertical project management with their respective teams. Link to all organizational charts

DSGor is also organized in a matrix-organization, in which the horizontal traditional line departments are crossed by the vertical divisional product groups and their project management.

In both NDSQ and DSGor, departmental managers' responsibility is to facilitate their departmental services to the vertical project management. While the project management has to take the required quick and resolute decisions in favor of their particular project to prevent disturbance to the line departments as much as possible. The project management has full responsibility in any decisions effecting the course and progress of their project underhand. Disputes and other possible conflicting project priorities are carefully handled at the next hierarchic level in the organization.

NDSQ's and DSGor's appointed project managers are authorised with full responsibility for realizing the contract, including handling of financial aspects. The NDSQ project manager acts as a single point of contact for the Client throughout the whole realization of a project. In case special request or issues are raised regarding the design of the boats the NDSQ project manager and DSGor project manager can have combined meetings with the client.

The project management as described in this handbook, integrates existing procedures of all (sub) processes related to the shipbuilding, ensuring that a consistent management approach is maintained throughout all phases of the project.

Certification

NDSQ is certified for :

- ISO 9001 : 2008
- ISO 14001 : 2004
- OHSAS 18001 : 2007

DSGor is certified for :

- ISO 9001 : 2008
- ISO 14001 : 2004
- OHSAS 18001 : 2007

The certification is reviewed externally every 6 months by Lloyd's Register and internally by the NDSQ audit schedule.

Communication

Key elements of communication between NDSQ and DSGor are:

- Secure the cross connection of arrangements and agreements made between different parties

4 / 65

Figure 24: First 4 pages of the Project Management Manual when converted to a Word file.

ANNEX D.

Send. CCtr	Pers.No.	Empl. name	Network	Activity	Receiver	Foreman	WC Pers	Work ctr	A/A descr.	Proj. Desc	WC Desc.	Date	Number	Department	MonthNr	Year	Submit.Hrs	Month	Rate	Week
70109001	00400204	Jojo Peter	Q.100139	Haul out & Transportation	Q.100139 2001	00400302	7011_058	7011_058	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Project Support Facilities	41870	1	Supporting departments	9	2014	1	Sep	1	34
70109001	00400230	Benny Kuriakose	Q.100139	General services	Q.100139 2003	00400302	7011_057	7011_058	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Maintenance	41879	1	Supporting departments	8	2014	1	Aug	1	35
70109001	00400230	Benny Kuriakose	Q.100139	General services	Q.100139 2003	00400302	7011_057	7011_058	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Maintenance	41878	1	Supporting departments	8	2014	1	Aug	1	35
70109001	00400230	Benny Kuriakose	Q.100139	General services	Q.100139 2003	00400302	7011_057	7011_058	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Maintenance	41877	3	Supporting departments	8	2014	3	Aug	1	35
70109001	00400230	Benny Kuriakose	Q.100139	General services	Q.100139 2003	00400302	7011_057	7011_058	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Maintenance	41876	5	Supporting departments	8	2014	5	Aug	1	35
70109001	00400230	Benny Kuriakose	Q.100139	General services	Q.100139 2003	00400302	7011_057	7011_058	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Maintenance	41875	5	Supporting departments	8	2014	5	Aug	1	35
70109001	00400230	Benny Kuriakose	Q.100139	General services	Q.100139 2003	00400302	7011_057	7011_058	Over Time - Reg. 125%	Repair Job on GRP Pilot vessel - NSV	Maintenance	41875	2	Supporting departments	8	2014	2	Aug	1,25	35
70109001	00400230	Benny Kuriakose	Q.100139	General services	Q.100139 2003	00400302	7011_057	7011_058	Over Time - Reg. 125%	Repair Job on GRP Pilot vessel - NSV	Maintenance	41874	2	Supporting departments	8	2014	2	Aug	1,25	34
70109001	00400230	Benny Kuriakose	Q.100139	General services	Q.100139 2003	00400302	7011_057	7011_058	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Maintenance	41874	5	Supporting departments	8	2014	5	Aug	1	34
70109001	00400230	Benny Kuriakose	Q.100139	General services	Q.100139 2003	00400302	7011_057	7011_058	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Maintenance	41872	4	Supporting departments	8	2014	4	Aug	1	34
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41897	1	Supporting departments	9	2014	1	Sep	1	38
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41896	1	Supporting departments	9	2014	1	Sep	1	38
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41893	1	Supporting departments	9	2014	1	Sep	1	37
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41892	1	Supporting departments	9	2014	1	Sep	1	37
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41891	1	Supporting departments	9	2014	1	Sep	1	37
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41890	1	Supporting departments	9	2014	1	Sep	1	37
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41889	1	Supporting departments	9	2014	1	Sep	1	37
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41886	1	Supporting departments	9	2014	1	Sep	1	36
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41885	1	Supporting departments	9	2014	1	Sep	1	36
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41884	1	Supporting departments	9	2014	1	Sep	1	36
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41883	1	Supporting departments	9	2014	1	Sep	1	36
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41882	1	Supporting departments	8	2014	1	Aug	1	36
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41879	1	Supporting departments	8	2014	1	Aug	1	35
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41878	1	Supporting departments	8	2014	1	Aug	1	35
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41877	1	Supporting departments	8	2014	1	Aug	1	35
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41876	1	Supporting departments	8	2014	1	Aug	1	35
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41875	1	Supporting departments	8	2014	1	Aug	1	35
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41872	1	Supporting departments	8	2014	1	Aug	1	34
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41871	1	Supporting departments	8	2014	1	Aug	1	34
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41870	1	Supporting departments	8	2014	1	Aug	1	34
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41869	1	Supporting departments	8	2014	1	Aug	1	34
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41868	1	Supporting departments	8	2014	1	Aug	1	34
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41865	1	Supporting departments	8	2014	1	Aug	1	33
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41864	1	Supporting departments	8	2014	1	Aug	1	33
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41863	1	Supporting departments	8	2014	1	Aug	1	33
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41862	1	Supporting departments	8	2014	1	Aug	1	33
70109001	00400261	Igor Smyelov	Q.100139	Project Management	Q.100139 1001	00400662	7011_053	7011_056	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Planning	41861	1	Supporting departments	8	2014	1	Aug	1	33
70109001	00400271	Vijeesh Madathil Kulaparambil	Q.100139	Haul out & Transportation	Q.100139 2001	00400302	7011_057	7011_058	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Maintenance	41870	4	Supporting departments	8	2014	4	Aug	1	34
70109001	00400271	Vijeesh Madathil Kulaparambil	Q.100139	Haul out & Transportation	Q.100139 2001	00400302	7011_057	7011_058	Over Time - Reg. 125%	Repair Job on GRP Pilot vessel - NSV	Maintenance	41870	1	Supporting departments	8	2014	1	Aug	1,25	34
70109001	00400331	Biju Kumar Gopinathan Nair	Q.100139	Aluminium backing strips	Q.100139 3008	00400297	7011_064	7011_021	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Outfitting Welding	41884	2	Outfitting	9	2014	2	Sep	1	36
70109001	00400331	Biju Kumar Gopinathan Nair	Q.100139	Aluminium backing strips	Q.100139 3008	00400297	7011_064	7011_021	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Outfitting Welding	41883	2	Outfitting	9	2014	2	Sep	1	36
70109001	00400331	Biju Kumar Gopinathan Nair	Q.100139	Aluminium backing strips	Q.100139 3008	00400297	7011_064	7011_021	Normal Hours	Repair Job on GRP Pilot vessel - NSV	Outfitting Welding	41882	2	Outfitting	8	2014	2	Aug	1	36
70109001	00400368	Ottobong Roland George-Udosen	Q.100139	HSE Support	Q.100139 2004	00400994	7011_055	7011_055	Normal Hours	Repair Job on GRP Pilot vessel - NSV	HSSE	41897	1	Supporting departments	9	2014	1	Sep	1	38
70109001	00400368	Ottobong Roland George-Udosen	Q.100139	HSE Support	Q.100139 2004	00400994	7011_055	7011_055	Normal Hours	Repair Job on GRP Pilot vessel - NSV	HSSE	41896	1	Supporting departments	9	2014	1	Sep	1	38
70109001	00400368	Ottobong Roland George-Udosen	Q.100139	HSE Support	Q.100139 2004	00400994	7011_055	7011_055	Normal Hours	Repair Job on GRP Pilot vessel - NSV	HSSE	41891	2	Supporting departments	9	2014	2	Sep	1	37

Figure 25: Example of data extracted from SAP and used for analysis

ANNEX E.

ANNEX F.

Project Descr.	Hours
M/Y Constellation - Refit Job	58714
Repair Job on Al Shoua (June 2013)	36931
Repair Job on Al Mirqab II - OCT 13 (Ri	11510
Repair of M.Y. Al Sailiya	9848
MY Al Mirqab II-Dec-Feb15(Riva 115) Proj	8394
Repair Job on Al Helaitan - Riva 85 (Oct	7906
Repair Job on GRP Pilot vessel - NSW	7847
Launching of Al Shoua (Aug 13)	6409
Repair Job on M/Y SHARQ	6042
Refit of MY Maracunda	5770
Repair of MY Al Ashmak & Dry docking	5156
MY Zikrit-Motor Yacht Jan-Feb15 Project	3691
MY Al Adaid	3384
Repairs, Test, Trials & storage on 2 ASD	2880
Repair Job on Yacht Al Zikrit - GRP, 31	2364
Repair Job on Al Adaid (Riva 115)-OCt 13	1066
Repair Job on Al Adaid (Riva 115)	765
Repair of MY Al Ashmak (former Sharq)Aug	692
3D Designing Service to NKOM	464
MY AL Shoua Quay repair works in Doha Po	373
Repair Job on Yacht Helaitan	372
Repair of Al Shoua	275
Repair Job on Al Mirqab II	171
Minor Repair MY Oyster at Pearl Marina	141
Small GRP Job for N-KOM	99
GRP Repair Job on Lifeboat of MSHEfREB	40
Total	181299,1

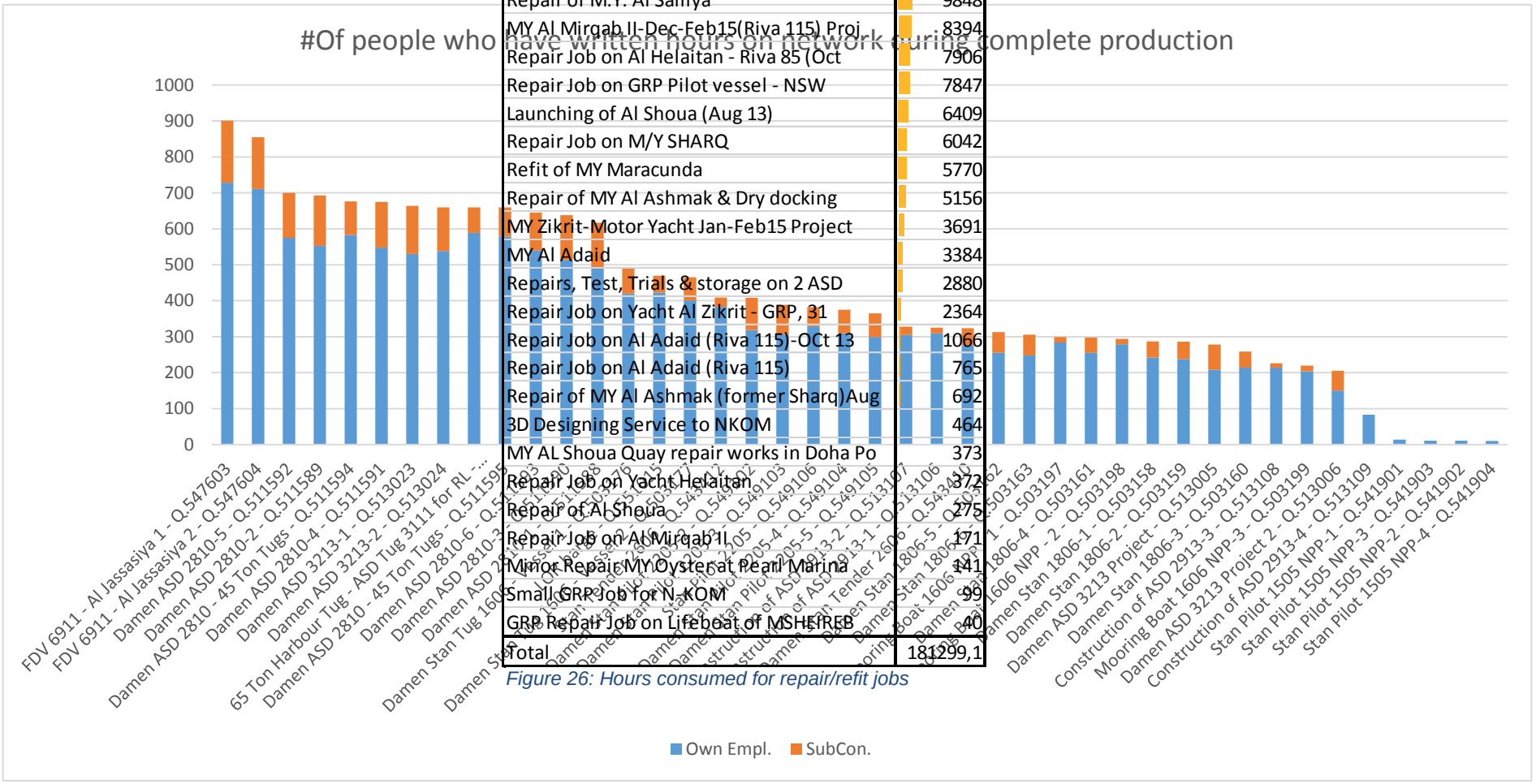


Figure 26: Hours consumed for repair/refit jobs

		2012												2013												2014												2015										Total
	Network	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	
FDV 6911 - Al Jassasiya 1	Q.547603																		1	1						25	36	183	235	322	389	372	427	487	460	490	500	496	470	471	486	516	489	407	401	439	356	901
FDV 6911 - Al Jassasiya 2	Q.547604																									17	17	153	210	279	345	326	393	455	423	485	482	471	456	449	440	479	405	413	373	418	339	855
Damen ASD 2810-5	Q.511592											41	88	106	161	162	200	225	183	166	195	188	203	216	226	185	236	136	123	12																		700
Damen ASD 2810-2	Q.511589						43	78	134	148	180	191	182	138	133	122	185	190	221	216	174	140	76	50	82	1																						693
Damen ASD 2810 - 45 Ton Tugs	Q.511594																					32	156	185	222	259	283	307	272	281	233	239	250	267	210	202	121	54	2									676
Damen ASD 2810-4	Q.511591										79	131	133	183	170	185	148	166	185	209	180	203	195	134	174	119	98	3																						675
Damen ASD 3213-1	Q.513023	108	125	162	151	123	145	144	121	134	144	158	151	136	146	134	89	67	150	144	136	169	118	109	100	110	75																						664
Damen ASD 3213-2	Q.513024	6	41	104	100	124	162	178	129	118	158	163	112	124	94	91	95	78	180	169	145	144	172	160	125	122	139	80	54	2																			660
65 Ton Harbour Tug - ASD Tug 3111 for RL	Q.511316																								4	17	32	16	125	227	284	255	293	314	275	277	276	229	236	218	210	178	140	34				660
Damen ASD 2810 - 45 Ton Tugs	Q.511595																					10	53	115	180	266	284	312	267	269	231	232	248	275	213	182	143	103	52									660
Damen ASD 2810-6	Q.511593												35	50	79	102	139	188	176	174	148	155	198	187	243	253	242	258	147	108	4																	645
Damen ASD 2810-3	Q.511590								34	95	145	163	179	201	167	142	144	153	206	248	203	185	174	80	114	1																						638
Damen ASD 2810-1	Q.511588	1		1	57	111	129	137	149	150	161	176	156	164	143	197	201	198	222	94	118	115	2																									617
Damen Stan Tug 1606 - Vessel 1	Q.503176																			6	2	10	83	144	108	123	156	164	196	195	193	147	61	1	1													491
LOR barge	Q.551015	206	227	220	208	215	150	152	133	143	113	117	76	79	6	8	1	1				27		1	62	1																						470
Damen Stan Tug 1606 - Vessel 2	Q.503177																			6		4	60	142	106	89	120	170	196	182	188	145	66	1														465
Stan Tender 2606	Q.543412																																4	3	3	4	9	8	9	56	104	143	147	164	160	120	147	136	118	409
Damen Stan Pilot 2205-2	Q.549102																		19	27	42	54	75	95	151	171	220	158	117	105	78	71	5															408
Damen Stan Pilot 2205-3	Q.549103																		14	21	12	42	54	71	138	162	218	137	125	125	66	71	5															389
Stan Pilot 2205	Q.549106																									9	11	6	6	2	1	2	15	43	50	59	89	147	155	191	156	140	27					382
Damen Stan Pilot 2205-4	Q.549104																			2	5	25	49	41	109	136	148	157	144	151	136	96	28															375
Damen Stan Pilot 2205-5	Q.549105																			2	3	16	40	34	86	126	138	161	155	148	128	72	31	1														365
Construction of ASD 2913-2	Q.513107																																					3	9	12	18	38	118	197	207	220	205	328
Construction of ASD 2913-1	Q.513106																																					6	13	23	38	62	159	207	212	206	199	325
Damen Stan Tender 2606	Q.543410		3	1		15	21	43	52	45	45	87	90	86	76	82	68	98	62	31	30	5																										324
Damen Stan 1806-5	Q.503162	14	50	63	80	83	67	79	104	97	87	71	35	22	26	17	6				2																												313
Damen Stan 1806-6	Q.503163	1	30	78	98	75	67	85	94	90	79	65	45	23	27	16	6																															306
Mooring Boat 1606 NPP - 1	Q.503197																																					7	10	11	40	139	166	164	132	119	106	299
Damen Stan 1806-4	Q.503161	54	75	62	67	76	63	20	72	73	78	74	65	37	28	15	3																															298
Mooring Boat 1606 NPP - 2	Q.503198																																					7	7	4	38	127	166	155	125	110	98	294
Damen Stan 1806-1	Q.503158	87	92	103	56	53	46	51	72	59	60	38	21	11	18																																	287
Damen Stan 1806-2	Q.503159	83	76	90	74	66	33	34	83	71	66	34	20	18	10																																	286
Damen ASD 3213 Project	Q.513005																18	66	108	159	123	37																											278
Damen Stan 1806-3	Q.503160	73	71	79	95	62	39	20	55	79	62	33	18	14	10	1																																	259
Construction of ASD 2913-3	Q.513108																																					3	8	11	14	26	47	51	101	147	145	226
Mooring Boat 1606 NPP-3	Q.503199																																					5	5	2	31	77	112	56	101	83	73	220
Damen ASD 3213 Project 2	Q.513006																4	22	26	175	87	3																											205
Construction of ASD 2913-4	Q.513109																																					3	8	11	12	26	37	36	41	35	51	83
Stan Pilot 1505 NPP-1	Q.541901																																					3	2	4	3	2	4	2	6	8	11	14
Stan Pilot 1505 NPP-3	Q.541903																																					1		1	1	1	3	3	5	5	8	11
Stan Pilot 1505 NPP-2	Q.541902																																					1		1		1	3	3	5	5	10	11
Stan Pilot 1505 NPP-4	Q.541904																																					1		1		1	3	3	4	5	8	10
	Total	324	362	370	379	399	373	446	491	493	511	510	503	502	450	433	440	490	542	580	510	489	518	540	625	584	603	587	559	613	597	594	609	644	640	640	642	617	618	615	647	664	634	621	604	672	589	

	Carpentry	Electrical	Hull	Other	Outfitting	Painting	Proj. Man.	Ship. Coord	Supp. Dep.	Grand Total
FDV 6911 - Al Jassasiya 1	44	44	239	69	173	78	8	12	266	901
FDV 6911 - Al Jassasiya 2	41	33	238	54	175	81	10	11	237	855
Damen ASD 2810-5	31	22	223	12	165	140	2	4	106	695
Damen ASD 2810 - 45 Ton T	23	24	203	20	153	95	4	8	149	676
Damen ASD 2810-2	50	30	245	11	174	130	2	3	60	671
Damen ASD 2810 - 45 Ton T	23	29	208	19	147	93	4	8	134	660
65 Ton Harbour Tug - ASD T	26	23	214	39	148	67	4	5	145	660
Damen ASD 2810-4	36	17	232	11	171	130	3	3	70	659
Damen ASD 2810-6	27	22	210	12	146	120	2	4	108	643
Damen ASD 3213-2	10	31	216	13	176	127	3	3	80	627
Damen ASD 3213-1	9	35	202	14	181	147	2	4	61	624
Damen ASD 2810-3	35	21	241	10	165	134	3	1	36	621
Damen ASD 2810-1	45	32	239	10	169	123			3	588
Damen Stan Tug 1606 - Ves	20	11	115	16	128	78	4	4	118	491
Damen Stan Tug 1606 - Ves	19	12	106	12	122	75	3	3	110	459
Stan Tender 2606	14	1	134	10	105	44	4	2	96	409
Damen Stan Pilot 2205-2	17	20	47	26	104	88	2	1	113	407
Damen Stan Pilot 2205-3	14	20	41	22	100	87	3	2	109	389
Stan Pilot 2205	16	16	45	41	102	57	4	2	108	382
LOR barge	5	33	123	6	97	3	3		115	377
Damen Stan Pilot 2205-4	18	21	41	24	105	76	2	2	91	371
Damen Stan Pilot 2205-5	18	23	34	23	108	76	2	2	85	360
Construction of ASD 2913-2			126		87	27	3	4	81	328
Construction of ASD 2913-1	2		123	1	89	29	4	4	74	325
Damen Stan Tender 2606	17	11	111	9	111	71			3	318
Mooring Boat 1606 NPP - 1	1		81	1	94	35	4	2	82	299
Mooring Boat 1606 NPP - 2	1		88	1	94	27	2	2	79	294
Damen Stan 1806-5		21	123	5	79	64			1	291
Damen Stan 1806-6		22	119	4	82	62			2	286
Damen Stan 1806-4		15	134	3	72	53			3	277
Damen ASD 3213 Project	12	10	70	15	38	63			59	267
Damen Stan 1806-2	1	25	104	3	74	51			3	261
Damen Stan 1806-1		22	96	3	83	48			11	260
Damen Stan 1806-3		20	95	3	71	47			3	239
Construction of ASD 2913-3			96		53	14	2	4	57	226
Mooring Boat 1606 NPP-3			75	1	72	16	2	2	52	220
Damen ASD 3213 Project 2	9	10	43	8	24	47			55	196
Construction of ASD 2913-4			8		47	2	2	3	21	83
Stan Pilot 1505 NPP-1							4	2	9	14
Stan Pilot 1505 NPP-3							2	1	8	11
Stan Pilot 1505 NPP-2							2		9	11
Stan Pilot 1505 NPP-4							2		8	10
#N/A	89	87	330	97	269	246	13	16	335	1370


Q.547603
Q.547604
#N/A
Carpentry
Electrical
Hull
Other
Filters
VIEW
Month
(All)
Network
is Q.547604 or Q.547603
Network
(All)
Year
(All)
Number
Count of Pers.No.
Count of Foreman
581.879,00
825
56
Date
Network
Count of Pers.No.
Count of Foreman
Number
5-3-2015
Q.547603
1
1
8,00
Count of Pers.No. by Submit.Hrs
Submit.Hrs
0
1
2
3
4
5
6
7
8
Q.547603
Q.547604
300
200
100
0
1
37
37
239
46
173
77
8
11
207
21
40
29
238
43
173
81
10
11
194
11
#N/A
Carpentry
Electrical
Hull
Other
Outfitting
Painting
Project...
Ship...
Supporti...
Yachts
Date
Number
Count of Pers.No.
17-9-2015
1.089,00
162
16-9-2015
1.146,50
167
Rate
100%
125%
150%
(Thousands)
250K
200K
150K
100K
50K
0K
19,24K
12,68K
0,25M
8,77K
0,15M
45,39K
6,54K
7,08K
68,35K
12,77K
9,47K
0,23M
8,81K
0,14M
43,05K
5,26K
6,59K
57,87K
Supporting...

ANNEX G.