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REPORTING TOOL IMPROVEMENT – CASE ALMACO

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Työn tarkoitus oli kehittää raportointimalli ja -rakenne ja kertoa mitä hyvässä raportissa pitää olla.

Oli tärkeää ensin tutkia raportoinnin teoriaa ja tarkastella erilaisia menetelmiä mitä raportoinnissa voisi käyttää hyödyksi. Hyviä esimerkkejä tuli vanhasta raportista ja kirjoittajan erilaisista kokemuksista projekteista. Esimerkkejä lähdettiin kehittämään teorian mukana, kunnes saatiin kattava malliraportti.

Malliraporttia esiteltiin projektiorganisaation jäsenille ja heiltä kerättiin palautetta, miten raportointia voitaisiin parantaa vielä lisää. Lopuksi palaute ja kehityskohteet keskusteltiin projektisuunnittelutiimin kanssa läpi.

Tärkeimmät saavutukset työlle oli valmis raportointimalli, joka on tarkoituksena ottaa vielä 2021 käyttöön eri projekteissa. Toisena hyötynäkökulmana ovat työn teoria ja esimerkit, joita voidaan käyttää koulutuksena projektiorganisaatiolle tai uusille projektisuunnittelijoille. Tämän lisäksi saatiin tärkeää tietoa tarvittavista koulutuskohteista.

Asiasanat:

Projekti, Raportointi, Aikataulutus, Kokonaistoimittaja

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The purpose of this thesis is to develop a reporting tool and reporting structure in a way that concludes what a good report consists of.

Firstly, it was important to investigate a theory for planning management and to look for different viable methods. Good examples came up from an old report and from writers different experiences from projects. Both of these examples contributed to a theory until a comprehensive model report was constructed.

This model was presented to the project organization and they gave feedback how to further improve the model. Lastly, the feedback and development areas were discussed with project planning team.

The most important achievement for this thesis is a reporting tool which is intended to be used in the end of 2021 in different projects. In addition to this, the theory and examples can be used as part of a training for an organizational project and new project planner recruits. In addition to these, there were significant discoveries for required training topics.

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ABBREVIATIONS AND GLOSSARY

Planner	Project planner is a dedicated person to plan and update the project schedule and makes sure the project will be finished on time.
Scope	Scope or project scope is a list or contract which determines all the work, material deliveries, design etc. within a specific project.
WBS	Work Breakdown Structure is a technique for easier project management.
Weightage	Weightage is a valuing method that compares different activities and their importance.
Primavera p6	Primavera p6 is a scheduling tool which is highly used in offshore-business.
MDL	MDL or Master Document List is a internal tool for ALMACO.

1 INTRODUCTION

The main objective for this thesis is to generate and gather information on how to prepare a good and efficient reporting system for all disciplines within a project, company management and employee's involved in the project. In order to conclude this specific report, it is critical to listen and interview the people who actually work within the project.

An issue with the reporting was identified when project organizations were evolving and the planning department didn't have a general report system in place. Different projects have unique reporting styles and the goal was not to make every report look exactly the same. The goal was to make project reporting more streamlined in a way that it follows the same principals and mostly the same data. This would save the need of training temporary planners on how to properly report inside different projects. In addition to this, by achieving similar reports it is easier for the project organization to understand the project report in different projects.

Before creating a good report it is important to define planning in turn-key projects and also to understand the disciplines inside the project organization. With the understanding of different disciplines work tasks, it is a lot easier to publish a good report and to highlight the possible risks and critical paths for each discipline.

To improve the reporting method and the report itself, it is crucial to first explain and give a brief introduction for planning and scheduling. Additionally, it is important to understand the project organization and planner in the project to generate the report. In order to improve the reporting method it is important to gather information and different feedback from the project organization, since those stakeholders are the primary customers for the project report. Next step is to bring up the good and bad results from the project team and forward them to the planners for review. The final step is to analyze the feedback and to create a new reporting system within the organization and to continuously develop the report.
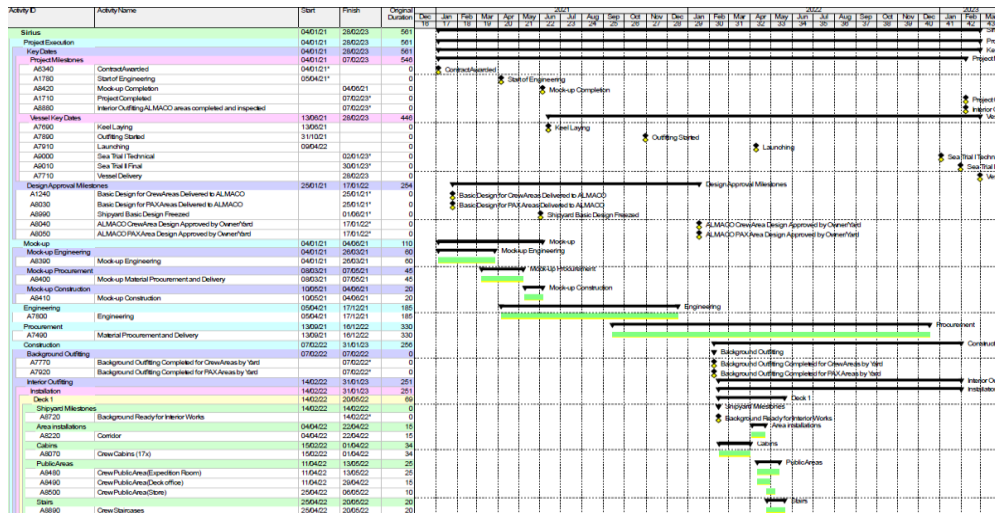
2 TIME SCHEDULE

Projects can be very complex, but a proper schedule allows to manage activities and phases in a timely manner. These phases and activities ensure that the management team optimizes between scope, cost and schedule. The performance is reported to the client and top management when the activities progress within the schedule. It is common that the project doesn't go as planned and the schedule needs to be adjusted. In normal situations it is necessary to change and update the schedule when there are challenges in planning, project scope changes, significant changes in the team or even environmental changes. For example covid-19 is a good example of an environmental change that pushed many projects to change their schedule. (Project Management Institute 2019a, 3)

Expertise and experience are crucial in creating a proper project schedule and in delivering a project in time. The schedule has to be made within the planned costs, resources, scope and performance of the project team. Time schedule is one of the most important requirements for project success. Once the time schedule is completed, it is a very effective tool for planning possible risks in the future, assisting proactive collaboration and analyzing project performance. Time schedule provides detailed information on how much resources should be used and when material and products have to be delivered. The time schedule should be analyzed and updated for the whole project life cycle. The picture 1 below portrays the durations for different activities with a gantt-chart.

Picture 1. A snapshot from primavera p6. Including a time schedule and gantt-chart.

2.1 Time scheduling tools

Scheduling tool is a software that contains algorithms, features, method for creating and manipulating rules, resources, and dependencies to create a proper working schedule for reporting, updating and managing. Scheduling tool is a program where WBS is created and updated. The scheduling tool provides various scheduling parameters and instruments to analyze data and performance within the needs of project. Key aspects of the scheduling tool includes:

- Ability to create WBS
- Ability to capture and update a baseline
- Ability to import and export data to other programs such as Microsoft Excel
- Select different types of relationships
- Add lag and lead to relationships
- Ability to follow the actual progress versus planner progress
- Add resources to activities to create weightage
- Perform different scenarios to minimize risks
- Compare new and old baselines against each other

- Analyze a potential changes to project baseline

(Project Management Institute 2019a, 3)

Primavera is a scheduling software made by the Oracle company. It's designed for high-performance planning and includes all the aspects of a great scheduling tool. It is a very common program in offshore business because of strict rules of documentation and reporting. (Gilda 2018)

Microsoft excel is a great tool to either import data to p6 or to export the data. Generating and controlling data inside excel is very fast and effective with the help of different formulas, and therefore it's very common to create data inside excel and afterwards import it to p6. Excel is also a great tool to communicate between different scheduling tools. For example, it is possible to export the full time schedule to excel format, send it to client or subcontractor and they can import the data to their own scheduling tool such as MS Project. Microsoft excel is a great utility program for scheduling but should not be used as the main scheduling tool.

2.2 WBS

WBS is a method to breakdown the total scope of work by project disciplines to accomplish a successful project in time. When the project scope describes the work tasks, material deliveries and constrains, the WBS shows the full project hierarchy level by level. The picture 2 below showcases many different hierarchy levels in big projects. WBS is a very practical tool that assists project organization to understand the project more clearly. It helps the the team to convert the large project scope to much smaller components. Often the smaller components have been used by a professional company in the past, which makes the components easily managed, measured and communicated. (Project Management Institute 2019b, 3–6

Picture 2. Snapshot from primavera p6. A 7 layer WBS.

It is very important to create the WBS in very early stages of the project and often this is sent together with the offer. The full project scope might not have been identified right after the offer has been accepted. Discussions between the client and the company might continue for a longer period of time. In some cases, the project scope can change during the most critical hours. It is very important to monitor the WBS throughout the project cycle. Modifications and updates to the WBS occur constantly (Project Management Institute 2019b, 3–6).

A quality and complete WBS includes most of these essential points:

- Assures all the activities needed to be done to fulfill the project scope.
- Provides a clear structure for managing, controlling and updating the project.
- Provides a clear breakdown of the project scope.

- Avoids any unnecessary activities or activities which are not in related to project scope.
- Includes atleast three levels, depending from the size and workload of the project.
- Contains internal and external activities which are critical for project.
- Updated in accordance with project life cycle and scope changes.
- Allows the user to understand and update WBS in project organization changes.

(Project Management Institute 2019b, 76–77)

2.3 Baseline

After the project has been planned and the WBS is completed, the work for the baseline can start. Baseline should always be created after the planning phase but before the start of adding actual data. Project baseline is a copy of the first initial schedule. The correct way to use baseline is to compare the actual data to the baseline. Because baseline represents the plan before the actual work took place, it assists on comparing the original plan and the current status. Therefore, baseline is critical tool for successful planning management. It is easier to oversee the entire project, monitor performance and spot the potential risks and accomplishmets with the correct baseline and reporting of actual data within the time schedule. If the baseline is somewhat missing information or key points, it can cause cost overruns or even project failure in the worst scenarios. In some rare occasions, the baseline is changed but this only happens if a major change occurs. In these situations, it is critical to notice the changes and to create the baseline with proper planning and speed. If the baseline is not changed within major changes it can lead to false reporting and this can cause major overruns in budget or problems. It is also important to save the old baseline for historical data and to analyze the project development and risks (Projectplan, 2021).

2.4 Resources

Resource management is a very important aspect of project management. In order to be efficient with resource management, it's crucial to get reports from the actual work site to understand the performance inside the project. With the comparison of planned resources and actual data from shipyards, productivity can be measured to make decisions. Different resources can be used inside primavera. Most common resource type is labor units which can be added for example to installation activities in order to add a hour based time to measure workload. Another common resource type is nonlabor units which can be added to activities to measure weightage of different activities. Often, these activities are linked together. The more workload the activity takes the more important it is for the project (Maltz 2018a).

2.5 Relationships

The relationships inside primavera p6 connects different activities. Predecessor and Successor activities are tied together to represent the task sequence in the schedule. Predecessor activity is controlling the start date and all following activities. Successor activity is activity controller by its predecessor activities. By adding Lead in relationships the successor activity can start before completing the predecessor activity. By adding Lag the successor activity cannot start right after the predecessor activity ends. (Maltz 2018b)

There are multiple different ways to connect the activities. The simplest and most common method is Finish-to-start(FS). The successor activity simply cannot start until the predecessor activity finishes. With these relationships the activities have to start at the same time and work in parallel. Furthermore, in Finish-to-finish(FF) both the predecessor and the successor activities have to finish at the same time. In Start-to-finish(SF) the successor activity can finish only after the start of the predecessor activity (Maltz 2018b).

Adding relationships at the start of the project takes extra time but will save time in the future. The scheduling tools automatically communicates if there are risks of slipping from the schedule or if some dates need to be changed in order to finish in time. When relationships are created in the beginning, the updates and modifications are a lot easier to execute when doing it during the project life cycle. By simply changing the dates or durations of the predecessor activities the scheduling tool automaticly changes all the other activities linked to the predecessor activity. This excludes majority of mistakes in doing the corrections manually and makes the updating more effective.

3 ALMACO PROJECT ORGANIZATION, THE DISCIPLINES

There are four main disciplines: management, engineering, procurement, and installations. These disciplines can further be divided to a huge amount of sub-disciplines. Picture 3 portrays an example on how large a project organization can be. Blue boxes represent ALMACO internal employees and orange boxes represent sub-contractors. For clarity, a cabin mock-up stage is used as an example, to make the introduction short and clear. In this case the contract has been made by the sales team and the responsible company will have to design, supply all the materials and construct the cabin. The picture below showcases a project organization chart for better understanding. The size of the organization depends from the size of the project.
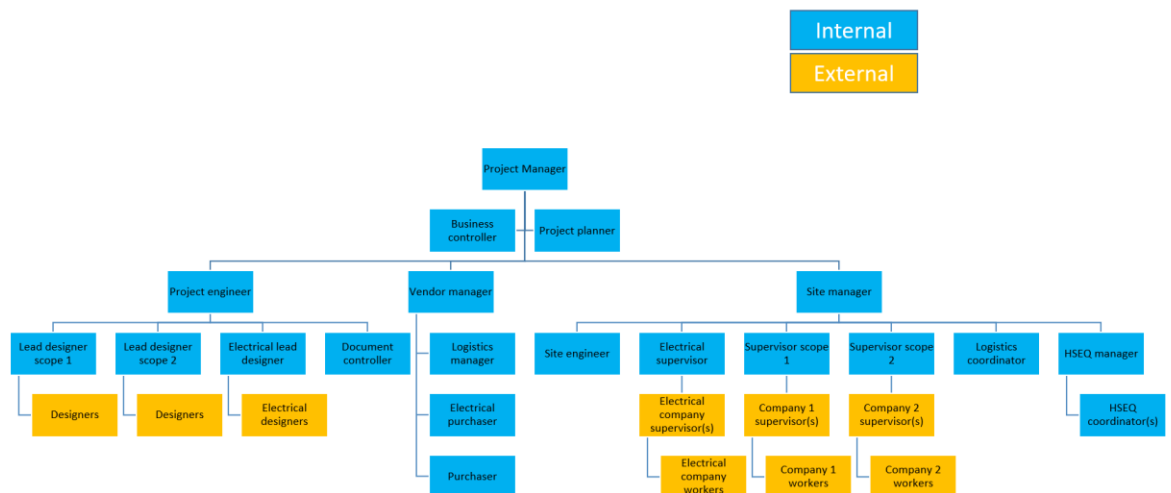
Picture 3. Project organization chart.

3.1 Management team

In big Turnkey Projects, it is crucial to have a team that takes decisions on what to do and when. This is called a project management team and it includes Project Manager as the main decision maker and a Project Planner who assists the project manager with schedule, risks and manpower. For different disciplines, there are specific managers who report to the Project Manager. Engineering has a Project Engineer, Procurement Vendor Manager and for installations Site Manager.

Planners are one of the few people who work on the project from the very start to the end. They are involved in all of the stages of the project; Sales, Engineering, Procurement and Installations. Together with sales, the planner can help to estimate the length of activities, manpower, risks and costs. When the contract is secured the planner can start focusing on improving the WBS and creating different layouts, tables and else that he needs to help the project to complete in time. In the engineering phase, planner will make sure all the drawings are completed in time without any delays for procurement. Purchase requests needs to be on time so that vendor managers can place orders without causing any material delay. Often in Projects, materials will be delivered from different continents and for example, sea freight will take at least 8 weeks from Finland to China.

When there are multimillion-dollar contracts, projects that takes several years to complete, activities that take thousands of hours – it is very important to schedule and plan activities well beforehand. A small delay in critical activities can create causal consequences that can have a big cost. For blocking the risk, there are project planners that focus on continuously scheduling, planning and analyzing the project.

3.2 Engineering team

Engineering is the first discipline that starts after the contract is made with a client. Engineering has some output data from the client, but this data often keeps living its own life and can change during the project. By using this data the designers will start to create a cabin design by using different designing programs, for example: Autocad for 2D models and Solidworks for 3D models. Picture 4 visualises life cycle from the beginning of the project to the end.

After the designer has reached to the point where the cabin mock-up drawing is ready, it will be checked by a team member in charge of the cabins, for example by a Lead designer or Project engineer. This stage is called 'the Designing phase' and at this point, the drawing has had its first Revision. If the supervisor notices some differences in the drawing, it can be sent back to the designer for corrections. This stage is called the 'Quality check'. This phase can continue as long as the differences have been corrected.

After the quality check, the drawing will be sent to the client and to the vessel owner. The client and the owner will make their remarks and corrections and send it back to the company responsible of the design. After this, the drawing will be corrected according to client's and owner's comment. The drawing is accepted if the client and owner are happy with the new corrections. After this, the engineering team will make the Purchase request for the procurement team. The drawing will also be sent to the installation team and it will work as the instructions for building the complete cabin.

In the final phases of the project when the vessel is being built and the main focus of the project is on installations, the engineering team will support the site. There can be some last minute changes or installation difficulties that require the attention of the engineering team. Furthermore, as-built drawing is the last objective for the engineering team. They are the final revisions of drawings and they show how the process of creating the final product. These drawings are made for the vessel's owner and are used for future maintenance and repairs. The below Picture 4 portrays the whole drawing cycle. It is common that there

are multiple revisions in a single drawing because of the multiple entities commenting on the drawing.
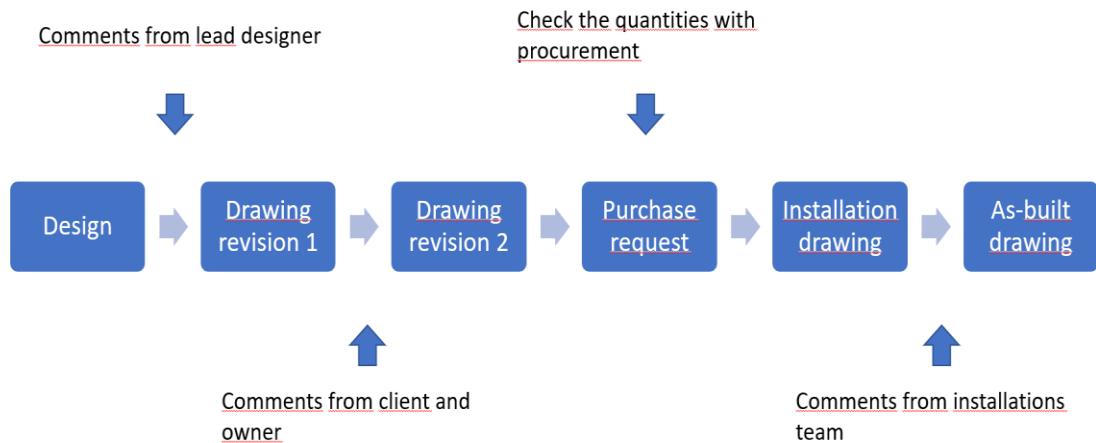
Picture 4. Drawings life cycle.

3.3 Procurement team

In the contract phase the sales team has estimated and budgeted all the materials. It is important to remember that this budget is only an estimate and profit has to be generated for the responsible company. For example, the toilet price is X plus the logistic expenses. Further along the project, it can be identified that there is a new manufacturer with the same quality material with the same price, but the logistical expenses are far less. That's why the Procurement team has started sourcing different manufacturers for different materials even prior the purchase request has been made by the engineering. The team has now contacted multiple manufacturers and chosen the best cost versus quality material for the project. After this, the buyer can proceed with a Purchase order.

After the purchase order, the manufacturer will start the construction of the material. When the material is finished, there will be a Factory acceptance test to check the quality of the product. If the product quality is not acceptable it will be repaired or reproduced. Additionally, if the product is accepted it will be sent

to the final destination. The procurement team is also responsible for the acquisition of installation subcontractors. The materials' full process is showcased in Picture 5 below. After requiring quotations from different companies, a decision on the best contractor for installations is made.
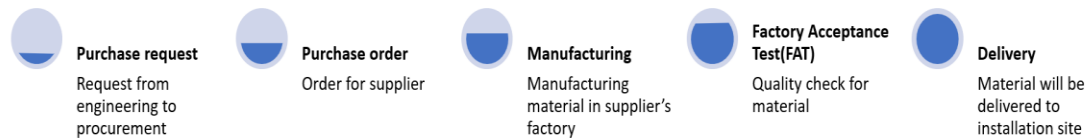
Picture 5. Material process from the start to the end in projects.

3.4 Installation team

All other disciplines lead to the final phase, which is called 'Installations'. At this stage, engineering has designed the product and procurement has sourced the materials and suppliers. Lastly, the installations team will build the final product.

Big vessels are built in smaller blocks and those blocks are then lifted and connected to each other in order to make bigger blocks. To simplify the huge vessel, building can be divided in two aspects: decks for vertical and firezones as horizontal areas. For example, there can be ten decks and five firezones in a vessel. This means there is a total of fifty different areas in the vessel. When the first few blocks have been finished and lifted next or top of each other, they are connected and work inside the blocks can be started. A huge crane lifting a block to the steel superstructure is visualised in Picture 6 below. This will continue until all the 50 blocks are lifted next to each other. The activities have to start as soon as possible and work in parallel inside the blocks because it takes a long time to produce these blocks and to finish the work inside.This means there are multiple different activities working at the same time.
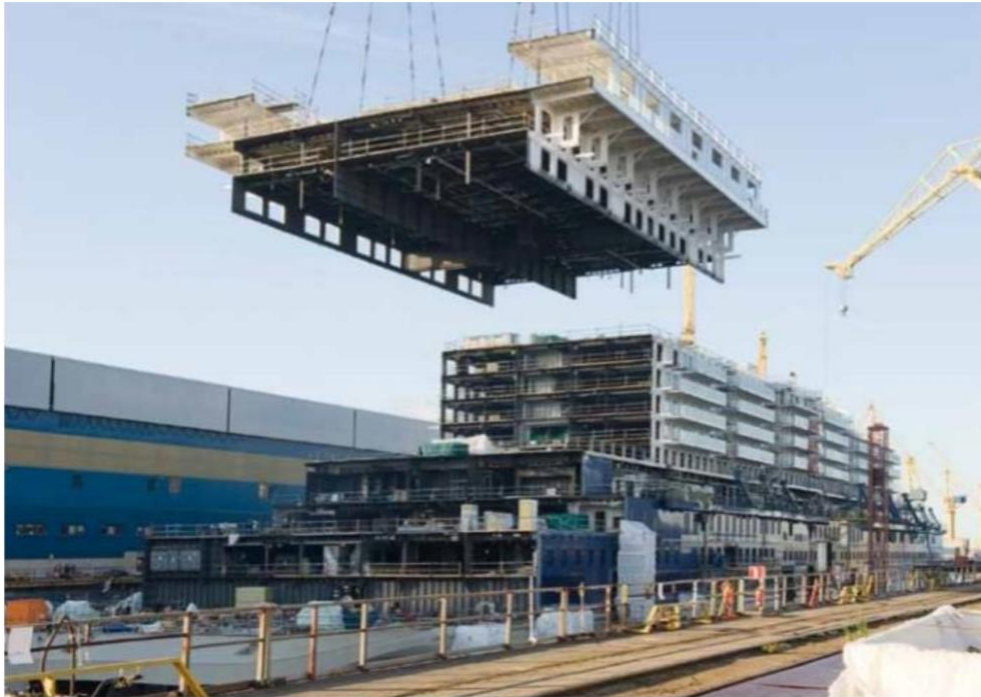
Picture 6. Crane lifting a block to a vessels superstructure. (Koivisto 2016).

'Background works' is the term used when the first installations inside a steel block are lifted and welded to the block next to it. These works include piping, welding, painting, insulation works and else. Once the background works are finished, the visual works can start. If the block is planned to contain cabins, their construction can be started either by lifting the modular cabins on the block or if by installing them on site. These visual installations have to work in parallel with the background works in order to save time.

The interior works start once all the background works are finished and the cabins are lifted, constructed and welded in place. The flooring, wall panels and ceiling panels finish up the corridors and again, these installations can be done in parallel with the installations inside the cabins. The last finishing touches inside the cabins are the flooring, furniture, electricals and other equipment installations. After all the installations are done and the client and the owner have inspected and approved the installations, there are fully finished corridors, cabins and other areas for passengers and cabins. All the electrical cables, piping and equipments are hidden between the steel and the interior panels and are only accessible from the service and maintenance doors.

4 ALMACO REPORTING TOOL

The project report is a crucial tool in order to stay on track on the status of the project. The reader should get a basic view on how the project is going and what are the primary tasks ongoing in each discipline. The report should be simple enough so that it is understandable for anyone outside the project organization who is familiar with project culture. The report should give key information on what are the most critical items for each discipline. It should also be quick to read but deep enough for understanding the key points. The time schedule is the main tool, since the report and all project activities are built around it. Disciplines are the people who are giving data for the project and to the report. The report is the tool which gathers the information from the time schedule and data from disciplines and then extracts that information back to the project organization, client and top management of the company. This chapter studies some of the most important tools included in the report.

Planned and earned value

Planned value is an authorized budget assigned to project activities. At any point in the project, planned value defines the work that should have been accomplished. Planned value can be reported for cumulative work to date or for a more specific reporting period. It can be also knows as budgeted costs for work scheduled or weightage. Planned value is always analysed and done before the project starts. It is a very important part of the project for the correct analysis of the work performance (Project Management Institute 2011, 9, 56–59).

Earned value is the measure for the work done at any point of the project life. Earned value can also be reported cumulatively to date or more specific reporting periods. Earned value is the quickest way to tell if the project is behind the schedule. Earned value can be known as budgeted costs for progressed work or work performed. Earned value should be always updated and reported for the whole project life (Project Management Institute 2011, 8, 67).

Planned value is often agreed with the project's client. This is because there can be project invoice milestones tied up to the earned value. It is very important to show the planned value for the project organization as it makes the current earned value easier to understand. It also shows how different activities are budgeted. Some activities simply take more time or cost more than other's so it is crucial to show the differencies between the activities.

4.1 S-curve

S-curve is a mathematical graph that uses relevant cumulative data for a project, in this case progress. It is called the S-curve because the graph usually forms an S -shape. The curve is shaped as an S because the beginning of the project is normally more slow phased when the team members are researching, developing or preparing the more heavy works, such as installations. When more progress is made, the growth accelerates quickly, creating an upward slope with a high angle. During this period, the team members of all disciplines are doing heavy work. Engineering is still doing last drawings, procurement is working full steam ahead and installation teams are starting their activities. After the big slope, the curve starts to get flat again. This is because the engineering is mostly finished, procurement has purchased and delivered all the material and installation team is finishing up their activities. Usually at this point, there only parts missing are the finishing touches and final inspections (Wrike 2021).

S-curve is a great way to show project status in a very effective and simple way. There is a baseline or planned value to show what is the required to progress in order to deliver the project in time. There is also a line that shows the current earned value or progress. It is also good to add some extra statistics to showcase the data and how much progress is needed on a weekly or monthly basis. If there are any signs of the current progress line slipping from the planned one, it is recommended to add a forecast to show how much progress is needed on a weekly or monthly basis to get back on track. Picture 7 clearly visualizes the actual progress falling behind.
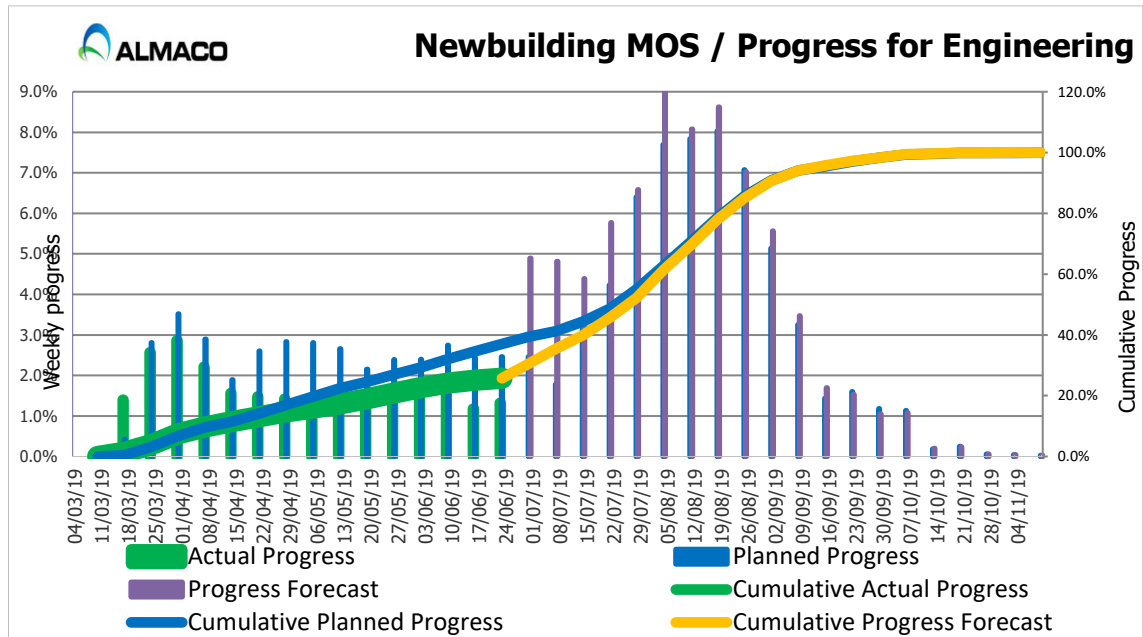
Picture 7. S-Curve to visualize the current situation of the Engineering progress

4.2 Work performance data

Work performance data includes the observations and different measurements that are identified during the project to finish the project scope. Data is gathered through the entire work scope of different disciplines and is passed to the planner for processing and further analysis. Key performance indicators (KPI's) and Consumer price indexes (CPI's) are great examples of work performance datas analyzed and completed. Since the project scope is always done parallel, the progress can be measured with these different performance calculators (Project Management Institute 2017, 26).

KPI's are great tools for checking the sub-contractor's performance. For example, before the installations are started the planned value is calculated it is easy to simply set up a plan for the duration of the activities. Once the installations are started, a report from sub-contractors is received which shows how many hours different activities took to complete. After this, the performance can be calculated.

For example, if an activity took 100 hours to complete instead of the planned 200 hours, the KPI of the sub-contractor is 50. The same formula can also be implemented in engineering. Planned dates are set for drawing transmittal. If the drawing has left in time it will be given a value of +1 and if the drawing has been sent after the planned date, the value will be set to -1. If there were two drawings and one of them was transmitted early and other one late, the KPI is 50. This is one of the methods for calculating performance. If the KPI is low, the prime reason for it needs to be investigated further.

4.3 Kanban

Kanban is a lean method that is related to workflow management. This method definess, manage and improves activities within different disciplines. Kanban visualizes the activities simply and maximizes efficiency. Kanban was first developed by Toyota for a manufacturing scheduling system but nowdays, many companies around the globe uses the system. The fundamentals of the system can be broken down into two principles and six practices. The most important practice for Kanban is to visualize the workflow. The most common way to do this is using Kanban board. Each Kanban card represents an activity and the board itself represents the workflow. The most important thing is to understand the process steps to achieve a milestone completion. When starting on item X it is on "To do" column. Once it is started it moves on "Doing" column and when completed it progresses to "Done" column. Figure 1 portrays a workflow and the process of purchase request, purchase order and finally the start of manufacturing (Kanbanize 2021).

The Kanban board is a great tool for improving the cooperation between disciplines. For instance, the engineering team can identify the correct time for the purchase request. This is crucial in order to keep in the schedule for the procurement team to complete the purchase order. It is also important to update the Kanban board weekly.

4.4 Manpower

One of the most critical aspect during projects is to plan the correct manpower, especially during the installations phase. The right amount of manpower ensures that the installations are done in time without any big costs. Having insufficient manpower tends to lead to a delayed schedule and in the worst scenarios causes penalties. In contrary, having too much of manpower might cause inefficient work and added costs.

If the project is late, the priority is to ensure sufficient manpower. In the beginning phase, it is possible to calculate the need of manpower for each of the activities. Following this, the scheduling tool automatically calculates the need for manhours for each day and activity. It is very important to follow and report the manpower and manhours for multiple reasons. The insufficiency of manpower is the most common reason for falling behind from the schedule. In these cases it possible that there is a big difference between planned and actual manhours. The first step is to check if the planned manhours are wrong. If this is not the case, there might be ineffective workers or a lack of manpower. The third option is that there are problems caused by other companies, manufacturers or clients. These problems must be recognized and dealt with in order to keep the schedule. The Figure 1 portrays the gap between Planned and Actual manpower. In the long run, this causes delays. Additionally, mid February is a holiday season due to the lack of planned manpower.
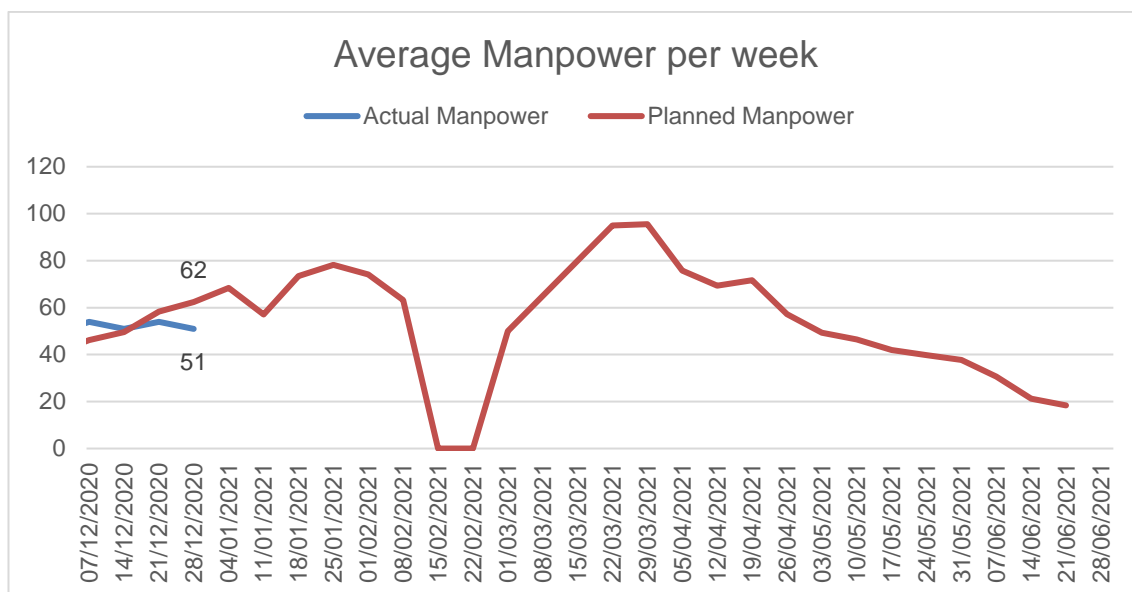
Figure 1. Graph for the weekly average of Manpower.

5 BACKGROUND AND METHODS

The reporting instructions and structure were created for ALMACO. ALMACO is a full turnkey provider for newbuilding and modernization in marine and offshore industries. ALMACO have 9 offices in 8 different countries. ALMACO includes 3 different divisions; accommodation, catering and service. Inside these divisions, there are different systems. For example, there are new sales, procurement and estimation, engineering and project management in the accommodations division. This thesis was designed for the ALMACO accommodation division project management team but the information can be used as a short introduction to planning and reporting.

The methods used for creating the structure and improvements are based on theory. The information has already been useful in previous reports, but it has opportunities in further improvements and development.

The next step was to create a sketch from the report. Some of this report had new and old information and it was showcased to key persons within the project organization. New improvements were established with the sketch and questions made for the interviewees. After the interviews, the feedback was gathered and processed and improvements were made for different slides. This concludes the process for the final report.

5.1 Methods

The first two methods incorporated for the thesis were firstly processing the problem with the old reporting style and secondly establishing the improvements for it. After the problem was acknowledged, the next step was to gather information on how to improve the report. Prior experience from projects already gave some insights on how the report could be improved. Additionally, it gave directions on viable information. The old reporting structure had information that was developed further. These topics gave a good starting view for building the new report sketch. The primary database for project

management information and specially planning management is the Project Management Institute. It is a huge institute that provides certificates that are highly valued in shipbuilding. Another good source for information is called the projectcubicle. This site provides some information and instructions for primavera p6 which is the main scheduling tool for Almaco. The information searched for the key topics were crucial so that the readers understand the importance of the topics for the report. The next step was to introduce the project organization as they are the main users of the project report. Before creating a report for the disciplines, the reporter must understand the main tasks for the different discipline managers. This also enabled to create the final structure of the report based on the sections for the disciplines. After the information was mostly processed and the old report improved, a sketch was made. This sketch was the basis for the interviews with the project team.

The interviews were half-structured interviews. The questions were made beforehand and they were the same with all the interviewees. All of the interviews were recorded so that the processing of the feedback would be more easier. The interviews were divided into two different phases. The first one was a one-on-one interview. The interviewees were different discipline responsibles, a project engineer from engineering and Vendor manager from Procurement. The interview questions were constructed around the sketch. There were some general questions and more specific questions for each slide. These specific questions already incorporated some small improvements found in the information phase. The next phase after processing the data from the first interviews was together with the planning team, including two planners and a planning manager. This interview was a discussion with the planning team rather than an interview. The team discussed and analyzed the feedback from other disciplines and gave their own ideas and feedback. The project manager also gave extra feedback after seeing the final results but was not part of the interview process.

5.2 Outcome

The interviews were a positive experience and gave a lot of feedback on how to improve the report. Team members are often too busy working in the projects so that they simply do not have the time to develop and improve processes. There were a lot of things the project team found useful and only some that they thought was not needed in the report. The biggest obstacle with the report was that the project team did not understand some parts of the report. Only after processing the feedback from the interviews it was found that the thesis could be used for project team trainings as well.

> *"This isn't telling much for me. Maybe there could be a small explanation somewhere, because I don't fully understand this. "*
> *Interviewee 1*

This finding was related to the earned value or weightage (Annex 1) and could be solved easily by using the chapter for planned and earned value. This finding is a prime example on how some items in the reports could be very clear for the report publisher but very strange for others in the project organization. Another similar finding from the interviews were a Baseline log (Annex 2). Interviewees understood that on these dates the baseline had been changed but they did not understand fully why it has to be reported. Again, this issue could have been solved if there was a short training on the main topics of the report. The same goes for the second finding. This thesis can be used as a basic reporting tool because the reason of the baseline log is told in the Baseline chapter.

> *"Okay here are the schedule changes but I think this is not quite my work area but this is not giving much for me other than I see that these dates the schedule is changed." Interviewee 2*

Both of these findings were slides for and from planning management which itself is quite a finding. This gives clear insight on the need for trainings for the project management team in order to for them to inform other disciplines.

Most of the improvements from the sketch to the new report were visual. For the publisher of the project some things were very clear, but confusing for other team members. These findings varied from showing the current status or progress with a simple label mark in the S-curve (Annex 3) to adding some green color for milestone (Annex 4).

> *"Maybe you could add a label to show the current progress. It's little hard to check the x- and y-axis and find the current progress"*
> *Interviewee 1*

The feedback related to the visual improvements strengthens the importance of building the sketch together with theory and project experience. This also confirmed the importance of creating the sketch before the interviews.

The biggest accomplishments were the development of the Kanban from the internal process procurement tracker (Annex 5). There is a huge potential to further improve this process and to maximaze its effectiveness. Another accomplishment was a summary from the master document list (Annex 6) which is a process for the engineering team. This sums up the current status and the summary is also used in thesis topics such as Work Performance Data and KPI. The summary was liked, much so that the procurement team also asked to add it to their process to the procurement tracker (Annex 7).

The results for the interviews were interesting and positive. The feedback was surprisingly comprehensive although the interview groups were quite small. This indicates that the feedback was understandable and it was easier to deeply analyse it. The report structure itself will be used for all future projects. However, there will always be some differences since every project is unique and require a variety of aspects to report. The theory and instructions for reporting will be used as a short instruction for new project management group members. It can also be shared for all project members who find it difficult to understand the rationale behind reporting.

The main result from thesis is the report structure. It gives guidelines for all project report publishers in ALMACO company. The thesis also gives good

general instructions for scheduling and the rationale behind reporting. After the interviews, there were small but effective improvements for different processes inside the company. This also made it easier to report and understand the project status. The last finding from the interviews was that the project team should aim to have a short introduction for the report in an early phase of the project and continue these trainings when the project is still developing.

6 SUMMARY

The target of the thesis was to create a clear general structure for project reporting in turnkey-projects. The need of improvement came up when reporting responsible's had substitutes and the reporting structures for different projects were completely different from each other. When there is not a standardized structure in the reporting system it takes a very long time to understand the process and to publish the report. Usually, when professionals are covering for each others they only maintain their tasks without trying to create or update anything for the project. The stand-in usually has other projects that might cause some overload on work. It saves a lot of time if the project reporting structure is already familiar for the stand-in and the stand-in can focus better on other projects. The benefit for creating a good and general reporting structure also gives the company an advance to train new project planners and trainees with the help of this thesis. This encouraged to invest more time to create a good and flexible way to report with some room for improvement or special requirements, since every project is different from another.

6.1 Further research

A great topic for a further research would be to focus entirely to Kanban and to build a project meeting based on the Kanban. The meeting could be focused between planning, engineering and procurement. In this meeting, one of the key points would be to investigate when the engineering finishes the purchase request so that the procurement can continue with the purchase order. Therefore, the Kanban board could be somehow built together with the procurement tracker. Additionally, the tracker could be improved in the context of the communication between engineering and procurement.

In the meeting the team could go through all the purchase orders and requests that need to be finished within the 2 weeks, what purchase requests will be done during the week, what purchase orders will be done during the week and

what purchase requests and purchase orders have already been done. By going through these items, the engineering and procurement phases would go more smoothly. The meeting could be held every week or every second week. The project planner, project engineer and vendor manager should attend in the meeting. If there are more engineers or designers who are doing purchase requests they should participate to the meetings as well. The planner should manage and instruct the team what has to be done during the week and the team members could give feedback if it's possible to achieve these plans.

The procurement tracker itself be improved if different disciplinies used some more time with it. During these meetings, the tracker would be on high use and the more it would be used the more people would notice some possible improvements.

6.2 Self-criticism

I think that the thesis topic was filled with a wide spectrum of information. The theory for project management and for planning management is huge. As the reporting in projects takes pieces from many different sections, it was challenging to give general but effective introductions for different sub-topics. Reflecting upon learnings, a better option would be to choose one internal process and to begin to improve it. The structure would be the same, but the topic would be slightly more strict and focused. But overall, I was happy with the results. I hope our company got great improvement ideas and some information on what different aspects should be more focused in.

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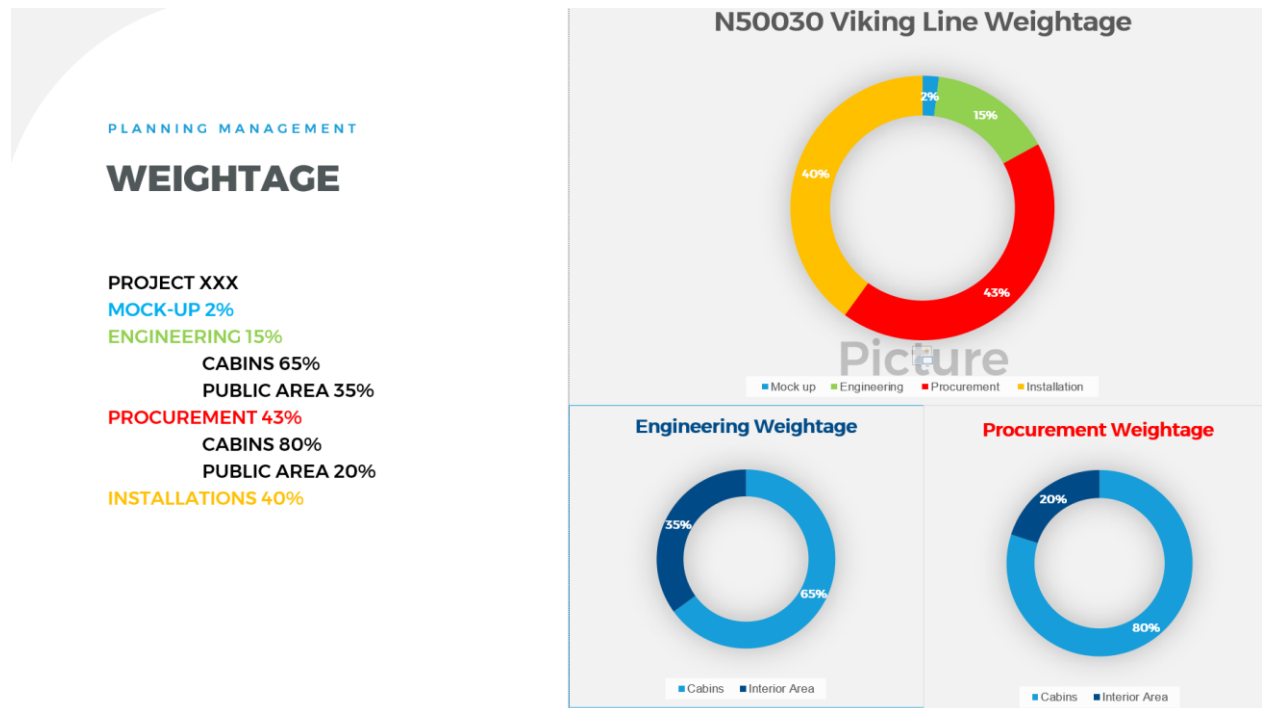
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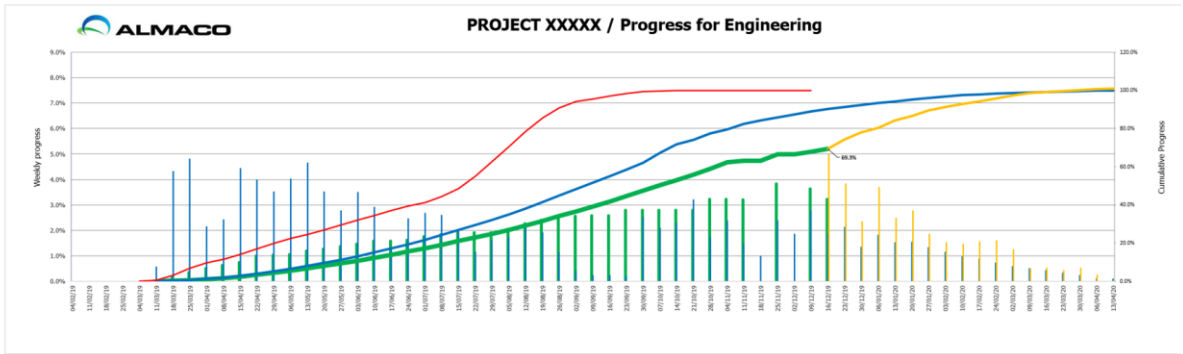
Baseline Log

PLANNING MANAGEMENT

BASELINE LOG

- ✓ Baseline rev. 0 Contract phase
- ✓ Baseline rev. 1 2019-1-22 – BKG schedule change
- ✓ Baseline rev. 2 2019-06-15 - BKG schedule change
- ✓ Baseline rev. 3 2019-12-15 - BKG schedule change
- ✓ Baseline rev. 4 2020-9-21 - BKG schedule change

S-Curve

Invocing milestones

PLANNING MANAGEMENT

INVOICING MILESTONES

5 %	Contract signing	15-Sep-20
5 %	Mock-up acceptance	01-Dec-20
5 %	All drawings accepted	01-Apr-21
15 %	200 wet units produced	30-Apr-21
10 %	Cabin production started	01-May-21
10 %	50% modular cabins produced	15-Jun-21
10 %	100% modular cabins produced	30-Jul-21
10 %	Cabin hauling completed	15-Aug-21
10 %	50% On-board installation	15-Sep-21
7.50 %	100% On-board installation	15-Nov-21
7.50 %	All installations completed	15-Nov-21

Kanban

ENGINEERING
KANBAN

ALMACO Doc No	ALMACO Document name	Filter	Planned start	Actual start	Planned finish	Actual finish
8036	Officer cabin 1 electrical	Electrical	20/07/2021	18/07/2021	03/08/2021	29/07/2021
8038	Officer cabin 2 electrical	Electrical	20/07/2021	18/07/2021	03/08/2021	29/07/2021
8041	Chief officer cabin electrical	Electrical	23/07/2021	21/07/2021	06/08/2021	01/08/2021
8042	Captain cabin electrical	Electrical	23/07/2021	21/07/2021	06/08/2021	01/08/2021
6167	Officer cabin 1 room layout	Cabin	20/07/2021	13/07/2021	03/08/2021	29/07/2021
6168	Officer cabin 1 ceiling layout	Cabin	20/07/2021	13/07/2021	03/08/2021	29/07/2021
6169	Officer cabin 1 wall layout	Cabin	20/07/2021	13/07/2021	03/08/2021	29/07/2021
6178	Officer cabin 2 room layout	Cabin	25/07/2021	18/07/2021	08/08/2021	08/08/2021
6179	Officer cabin 2 ceiling layout	Cabin	25/07/2021	18/07/2021	08/08/2021	08/08/2021
6180	Officer cabin 2 wall layout	Cabin	25/07/2021	18/07/2021	08/08/2021	08/08/2021
6187	Officer cabin 3 room layout	Cabin	27/07/2021	27/07/2021	10/08/2021	10/08/2021
6188	Officer cabin 3 ceiling layout	Cabin	27/07/2021	27/07/2021	10/08/2021	10/08/2021
6189	Officer cabin 3 wall layout	Cabin	27/07/2021	27/07/2021	10/08/2021	10/08/2021
8040	Suite 1 electrical	Electrical	27/07/2021	27/07/2021	17/08/2021	15/08/2021
8047	Suite 2 electrical	Electrical	27/07/2021	27/07/2021	17/08/2021	15/08/2021

ALMACO

Procurement Follow up list in project, PUR06

olumn responsibilit
ENGINEERING
PLANNING
PROCUREMENT
LOGISTICS

PR Number	PR Revision	PR date (planned)	PR Date	Area	Filter	Description	Supplier
N50030.E.E.009	1	08/12/2019	24/05/2019	Cabin	Cabin	Cabin downlights	Company X
N50030.E.E.010	1	08/12/2019	29/05/2019	Cabin	Cabin	Wet unit floorheating	Company X
N50030.E.E.011	1	26/11/2019	24/05/2019	Cabin	Cabin	Cabin downlight	Company X

Summary from MDL

ENGINEERING

STATUS

ALMACO MASTER DOCUMENT LIST SUMMARY 27/09/2021

	Total	ALMACO	Client
Mock-Up drawings, in total	16	0	0
General documents, in total	5	0	1
Cabin documents, in total	100	1	1
Wet Unit documents, in total	10	0	0
Public Area documents, in total	50	1	0
Electrical documents, in total	100	1	1
Internal documents, in total	25		
Documents all to client, grand total	306	3	3
Documents all, approved by client	300	0	
	98.04 %	0.98 %	0.98 %
Documents not sent at all	0		
Documents already sent.	300		

Summary from Procurement tracker

PROCUREMENT

STATUS

ALMACO PROCUREMENT TRACKER 27/09/2021

	Total	PR's	PO's
Electrical PO's	110	110	100
Cabin PO's	100	100	100
Corridor PO's	50	50	50
Public Area PO's	50	50	50
Purchase orders done	300	310	300
Purchase requests done	310	0	
		100.00 %	96.77 %
Purchase orders not done	10		
Purchase orders done	300		