



**Industrial Placement
Interim Progress Report 1**

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with

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28th July 2014 to 24th July 2015

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SUMMARY

Over the course of the last two months working in the Design Office at Griffon Hoverwork, a lot of learning about the company and engineering processes has often been done whilst on a project.

Having undertaken a variety of projects such as designing an actuator guard for the Canadian Coast Guard and designing a ladder to connect the wheelhouse to the passenger cabin, this short time period has taught me a considerable amount about engineering standards and practices, as well as to consider the manufacturing of a part when designing it. This report gives more details about the projects assigned, as well as my thoughts on the placement so far and expectations for the future.

LIST OF SYMBOLS, ACRONYMS AND TECHNICAL TERMS

12000TD	A twelve tonne payload hovercraft, currently being built, that will operate as a passenger ferry from Southsea, Portsmouth to Ryde, Isle of Wight.
995ED	A hovercraft currently being developed with search and rescue operators in mind.
Archived parts	Redundant parts used in a previous version of an assembly, kept for traceability.
BOM	Bill of materials. It consists of the raw materials, sub-assemblies, sub-components, parts and the quantities of each needed to manufacture an end product
DXF file	A file compatible with all CAD software used in the industry that gives a 2D representation of a part.
ECR system	Engineering change request system.
eDrawing	A file compatible with all CAD software used in the industry that gives a 3D representation of a part.
EPDM Vault	The storage system currently used by the company.
GHL Live Vault	The storage system previously used by the company. The company switched to EPDM Vault as this became too disorganized.
Passenger cabin	The area in which passengers were situated while the craft was in operation.
Production job card	A document that gives the detail of the job to be performed in the production facility.
SolidWorks	The CAD modelling software currently used by the company.
12000TD Build Stage 1	Officially called "Module Fabrication", this stage covered the creation of the main hull of the craft.
12000TD Build Stage 2	Officially called "Module Outfitting", this stage covers the creation of cabin parts, such as decks, engine frames and wheelhouses.
Wheelhouse	The area from which the craft is piloted.
Work package	Created and controlled by one detail designer, this is a folder that consists of an assembly, all the parts needed to make this assembly and CAD drawings. It also contains DXF files, eDrawings, PDF's and archived parts, as well as a production job card and a BOM. Each task generally assigned is a work package relating to a specific craft.

INTRODUCTION

Griffon Hoverwork Ltd. is a British hovercraft manufacturer based in Merlin Quay, Southampton since the beginning of 2011.^[1] Created from the merger of Griffon Hovercraft Ltd. and Hoverwork Ltd. in 2009 by the Bland Group, Griffon are at the forefront of hovercraft development and currently have over 200 craft operating in 40 countries spanning five continents.^[2] These craft are used in a variety of applications such as search and rescue, passenger ferries and military operations, as well as other non-standard uses such as cricket pitch covers and crop sprayers.^[3]

The year long placement with the company involves working in the Design Office, where a new craft (the 12000TD) is being developed from concept to production, with release due in summer 2015. The role is to include;

- Developing system level designs into detailed solutions under the supervision of in-house engineers.
- Producing complex 3D models, production level drawings and design instructions.
- Interaction with the production team on live hovercraft builds to provide technical advice and improvements in design.

WORK, PROJECTS AND ASSIGNMENTS

Having joined the company at a very busy time for the company, at the conclusion of Stage 1, there wasn't an opportunity to have a formal induction, and as such a lot of learning (about EPDM Vault, engineering standards and common practices etc.) was done on the job. A brief tutorial was given on SolidWorks, but by the second day, a project involving the design of a fork to connect two actuators on the 995ED had been assigned. As a result of this, the bulk of familiarization with the modelling software was again done during a job.

A selection of some projects undertaken within the first two months is detailed below. The final assembly drawings for some of these designs are included in **Appendix A**.

GIRDER AND TRANSVERSE BULKHEAD DRAWINGS (12000TD – STAGE 1)

With the rest of the Design department working flat out to complete modelling for Stage 1, a significant amount of work packages had no technical drawings, and thus couldn't be released. As a result, one of the first projects was to complete two work packages by creating drawings to a standard production could use to build the part.

SERVICE BAY BULKHEAD (12000TD – STAGE 2)

Originally a series of vertical aluminum sheets welded together to form a wall that separated the main passenger cabin from the servicing area of the craft, the service bay bulkhead was also used to house several vital pieces of electrical equipment, such as distribution panels and

battery containers. However, this storage of equipment was tougher by the fact that the servicing area of the craft was only 600mm wide.

This component went through a redesign, and eventually ended up as a welded aluminum framework. As per redesign, the sheets were now to be attached to the framework at a later stage, as opposed to directly to the craft.

UPPER SIDE BODY CONNECTIONS (12000TD – STAGE 2)

Situated on the exterior of the hovercraft, the upper side body connections could be simply described as marginally angled external flanges that supported the deck of the hovercraft. The design of this part was driven by other work packages created by different designers. At the time of writing, this is still in development.

WHEELHOUSE LADDER (12000TD – STAGE 2)

Access to the wheelhouse was to be granted by the design of a ladder. However, because the ladder was situated in the passenger cabin, it couldn't have a slant of more than 5° or else it would protrude into the passenger walkway. It also needed to have fileted edges wherever possible to reduce the risk of injury to a passenger. Saying this, the major problem (at the time of writing) was the fact that the ladder couldn't be bolted down to the floor traditionally, as access to the underside of the floor was not possible in this region.

ACTUATOR GUARD (CANADIAN COAST GUARD)

All Griffon craft come with a 12 month warranty as standard, during which they offer close support to any customer experiencing issues with their purchase. ^[4] In this particular case, salt water was causing actuators in a variety of positions and orientations within fire shutters to rust up, and as such guards needed to be designed for each to stop this.

This was complicated by the fact that drawings for the area affected were hard to source, as they were contained within a legacy vault from before the merger. Adding to this, the actuators were discovered to have been rotated 90° in the craft as opposed to the model, and access to the back of the actuators wasn't possible, making securing them a difficult task.

CONCLUSION/REFLECTION ON THE PLACEMENT SO FAR

Having been at Griffon for just over two months at the time of writing, I feel I've learnt several key modelling standards and techniques that I will be using when I get back to university. Although having to learn on the job a lot more than expected (and hence making more mistakes than I would have expected/liked), the knowledge gained in this short time period certainly has given me a bigger insight into manufacturing techniques and practices.

As the modelling section of the Design Office has been reduced from 9 to 5 members in the two months I've been at the company, the next couple of months should hopefully see me beginning to become an integral member of the department. Adding to this, earlier target meetings have suggested that opportunities to run the ECR system and spend some time with production should arise soon.

REFERENCES

1. http://en.wikipedia.org/wiki/Griffon_Hoverwork
2. <http://www.griffonhoverwork.com/about-us.aspx>
3. <http://www.shippingandmarine.co.uk/article-page.php?contentid=15908&issueid=454>
4. <http://www.griffonhoverwork.com/products-services/support-services/after-sales-support.aspx>

APPENDIX A

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