Scheepsbouwkundig Gezelschap

“William Froude”

Sinds 1903

Preface

Dear Reader,

The Scheepsbouwkundig Gezelschap S.G. “William Froude” is the Study Association of Maritime Technology and Naval Architecture at the Technical University of Delft. For the past 113 years our study association has acted on the behalf of our students. S.G. “William Froude” has been involved in monitoring and improving the quality of the education. Next to this, organizing excursions, guest lectures, social activities and other means to support our members in their academic career has been an important part of our existence. “William Froude” offers its members the opportunity to discover the many aspects, possibilities and developments of the maritime industry in both the national and international maritime industry.

Challenging excursions, two-day trips and even a casetour of two days are organised annually. But the study-trip abroad, which lasts about a week, is the highlight of our year. We call it the MBE, Meerdaagse Buitenlandse Excursie, which roughly translate into:
Multiple-day excursion abroad. We travelled from the 1st of May till the 10th of May trough the UK with 35 students and one assistant professor. The primary goal of this trip is to get a closer look at the maritime

industry in the UK to gain perspective on our own industry.
The preparation for this trip started in September 2016 when the first ideas where thought of. My personal goal was to visit a country which is very different than those visited before to offer the students as much perspective of the industry as possible.
The United Kingdom as a country is well know among our students but the British maritime industry is not. Being a rich western country it focusses on different markets than Croatia which we visited two years back and also shows a great difference in quality of work and engineering.

During this week we managed to visit six different companies, had a tour on the ferry and visited two museums. And between all of these visits we also had the chance to discover the British culture and its great cities. I can say for myself that my view on the UK has changed and I hope I gave the students the same experience.

I would like to end with thanking everybody who helped us make this trip possible: the companies, the sponsors and of course the participants. I have had an amazing time and I hope you all did too.

Enjoy reading this travel report!

Met immer luide plonsch,

Jarno Kuipers
Commissioner of Excursions
The 113th board of S.G. "William Froude"

Table of contents

Participants

Léjon Zorn
Egbert Kooij
Siemen Obers
Andreas Feys
Jarno Kuipers

Jeroen Pruyn

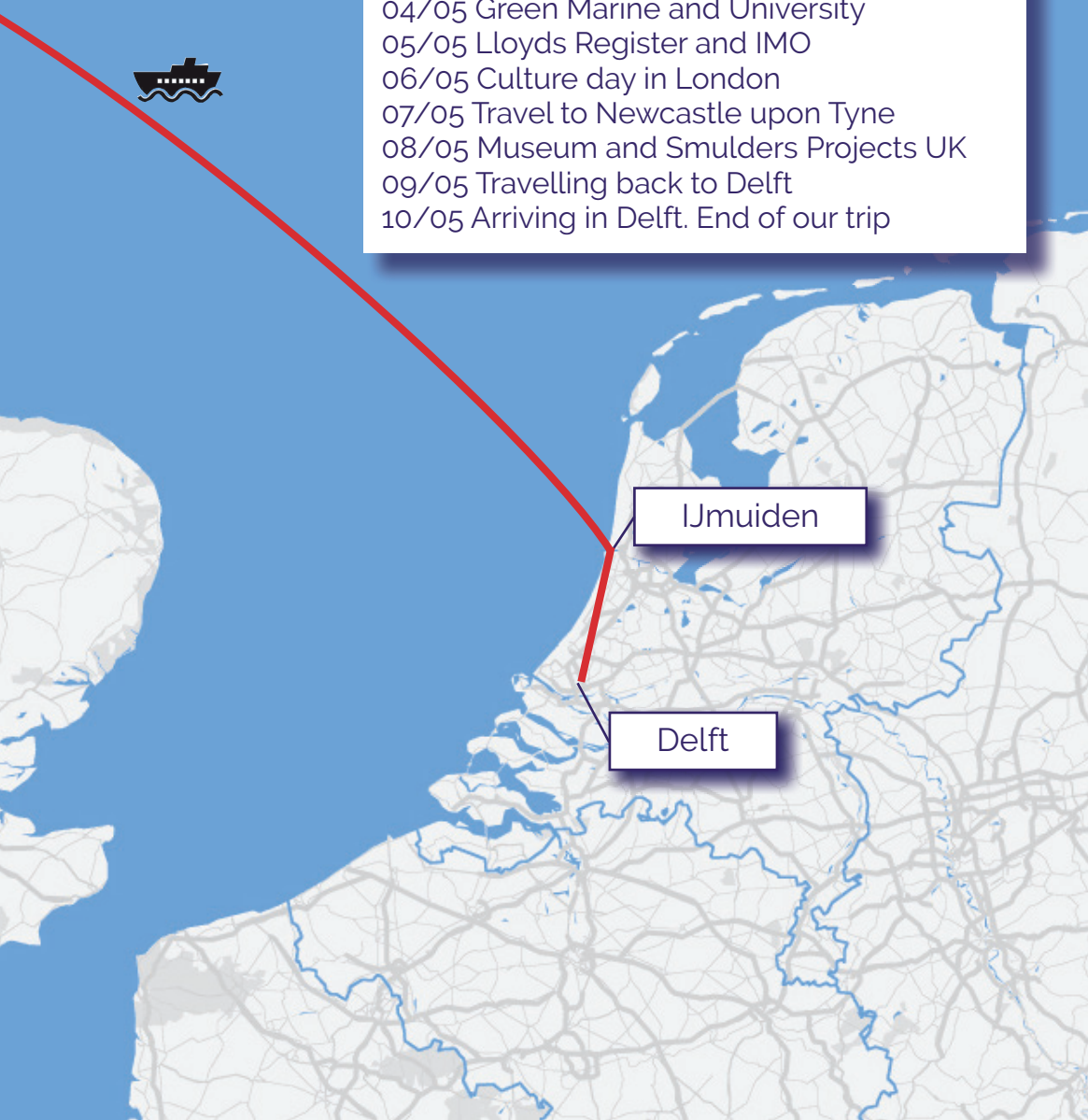
Jasper Barsingerhorn
Gerben Dekker
Pieter Spruijt
Bart Diesveld
Marijke Kommers
Vincent Mullenders
Dominique Smit
Martijn Boekhout
Willemijn Botman
Timo Boxma
Thomas IJzerman

Joost Cappellen van
Tijs Zee van der
Koen Essen van
Bobby Visser
Jelle Willeijns
Robert Zwart
Annemieke Smeth de
Koen Ende van den
Julien Hermans
Ferdinand Heurn van
Brian Pagter de
Lucas Peeters
Laura Slootweg
Joep Spek van der
Mick Velden van der
Bart Kroft van der
Bas Rossewij
Lars Heugten van
Sam Klap


Newcastle upon Tyne
Liverpool
London
Southampton

Itinerary

01/05 Travelling to Newcastle upon Tyne
02/05 Visiting Liverpool
03/05 Rolls-Royce and travel to Southampton
04/05 Green Marine and University
05/05 Lloyds Register and IMO
06/05 Culture day in London
07/05 Travel to Newcastle upon Tyne
08/05 Museum and Smulders Projects UK
09/05 Travelling back to Delft
10/05 Arriving in Delft. End of our trip



From the lecturer:

To fall between the ship and the Quayside

Of course this title makes no sense in English, only in Dutch. The correct English would be: to fall between two stools. However, this way I would lose the maritime connection, so nicely presented in the Dutch variant. It means to not belong anywhere. Why would I give my article for the MBE journal such a title?

Well this trip, thanks to the many hours on the bus, left me quite some time to contemplate on the groups dynamics and my own role in it. Not my specialty, but something that has had my interest ever since I came into contact with it, during my own master time at Maritime Technology. I will get back to the other group dynamics soon, but I will start with my own role and reason for the title. As a member of staff, you are joining 35 students on a study tour. Usually if I do something with students, be it teaching, coordination, course and program evaluations or even the Master Introduction, or drinks. I am responsible for all or at least quite some aspects of the organisation. In the case of the study tour, I carry no official responsibility, so I am basically one of the students. On the other hand, I am not truly one of the students, I am not part of their daily life and I left most of their struggles behind me. So I could have fallen between two stools.

Luckily for me, all students were willing to accept my company, be it at a dinner table, busride, or a drink in a bar and I have had many interesting discussions and laughs throughout the trip. My goal was to get to know the other side of the students better and let them get to know the other side of me better as well. For me that part of the trip was at least successful.

As for the other side, the group dynamics. I can see it as one of the three important values of a study trips: Venturing outside of your familiar group. When MT used to have 30-40 students a year, it was easy to get to know 2-3 years above and below you. Nowadays there are 80+ students in a year and if you are not a mentor, you will know very few people after you. Such a trip breaks up these groups and allows new connections to be made. So I was glad to see for example, the adaptation of first years by the 4+ years students.

Another aspects is learning about practice. With the various company visits, it is always good to see, attention is being paid and more importantly, questions are being asked to make sure you understood everything right. It also makes the visit much more enjoyable for the presenters, as it shows them what is understood and what is not and makes you more memorable as a group.

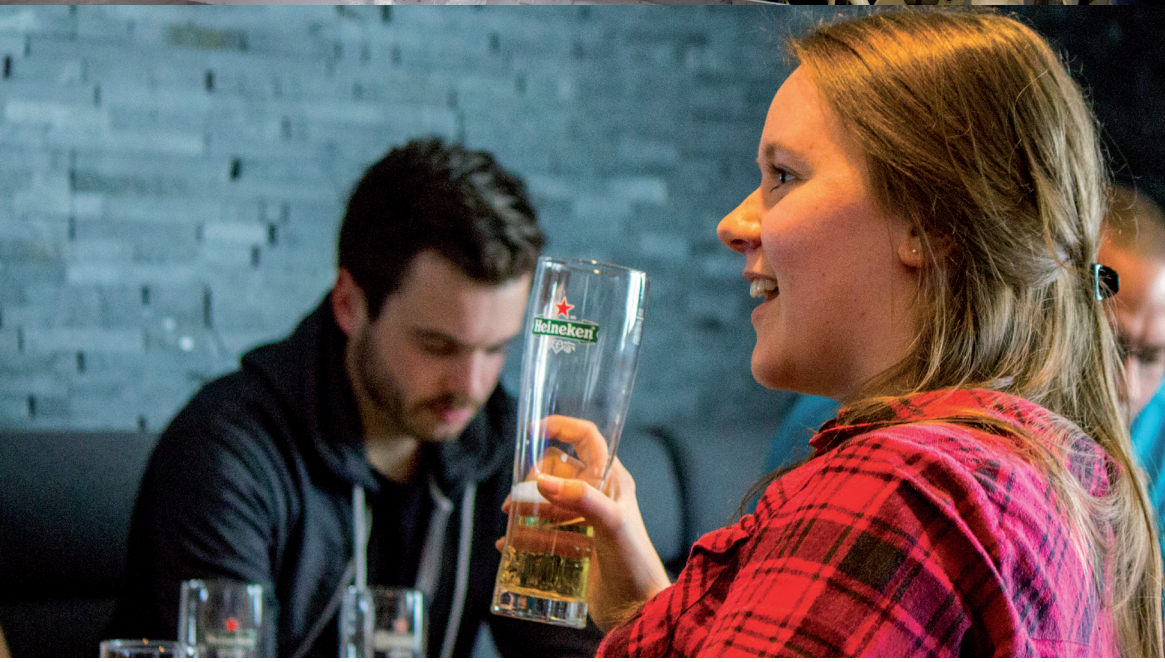
The last important aspect of such a trip, is building up your network. With a visit to the IMO and Smulders, this trip, could not have shown a larger difference, yet both are built upon a network and a reputation. For these the first two elements are important as well.

So to summarise I feel it was a good trip, where I enjoyed myself and did not feel I fell between two stools very hard. So I would like to thank the participants and the board for this chance, once more, and hope many of you will get the chance to do another trip in the future, of course something I do wish for myself as well.

Jeroen Pruyn

Departure

The whole trip started Monday the first of May at Delft University of Technology. Everybody took a seat in the coach and we headed towards the port of IJmuiden. It took quite some time to check-in a group of 37 people but we all made it on-board on time.
We now had well over half a day to relax on board of the 'King Seaways'. But relaxing can be done in multiple ways. And one of them is looking at boats. Therefore it is not very surprising that it did not take the board very long to organise the first excursion of the week: a tour of the ferry! It was split in two parts. In the evening we visited the engine room and in the morning the bridge. The crew of the 'King Seaways' really took their time to show us everything there was to see and answered many questions. It is not common for us to visit a ship while being at sea as most of the times our visits take place in a harbour in the Netherlands. We were even lucky enough to see a lifeboat training near the harbour of Newcastle upon Tyne. Between looking at boats we just enjoyed the on-board entertainment and the bars as most of the passengers.


Heineken

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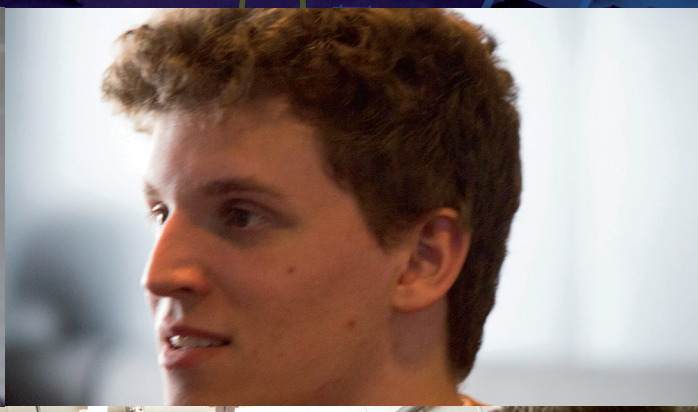


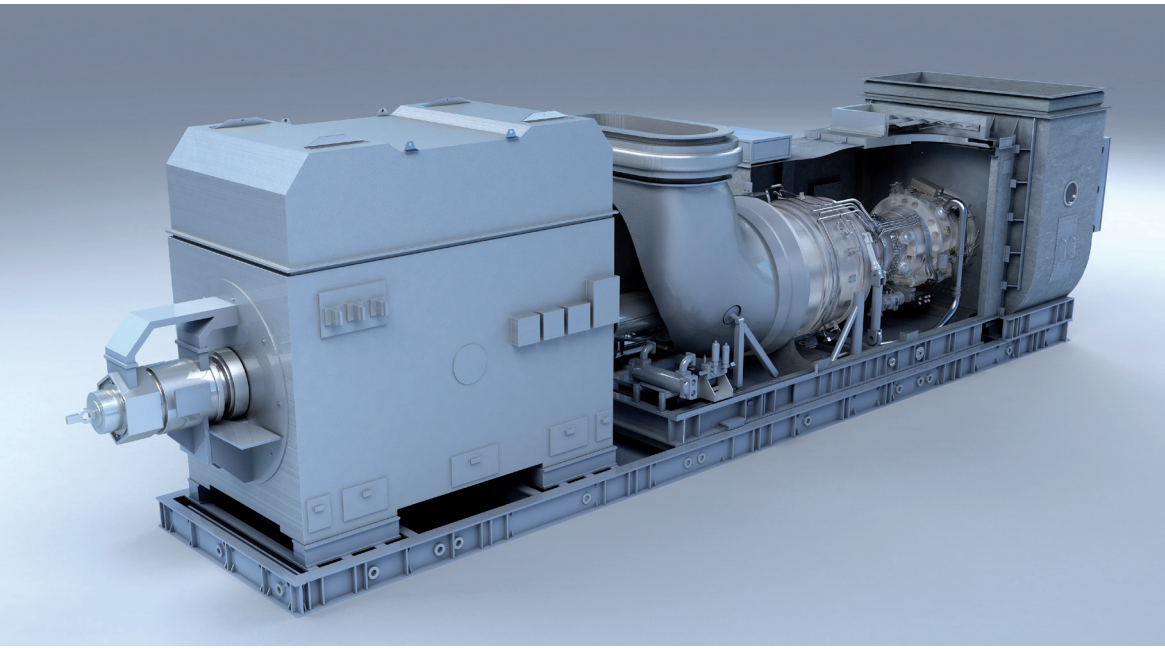
Rolls royce

By Pieter Spruijt

On the second day of our journey through the biggest island of Europe we left our friends from Liverpool and headed to Bristol to visit Rolls Royce gas turbines. After traveling for one and half days, everybody was excited to visit the first company of our trip. Rolls Royce is started and headquartered in the United Kingdom where it still directly and indirectly employs over 115,000 people, which is more than one in every 300 jobs in the UK. Bristol is the main defence site of Rolls Royce housing both an aerospace and a marine department. At this site, the MT30, the biggest maritime gas turbine, is manufactured and tested.

After a short introduction and walk from the main entry hall to the assembly shop the group was split into two to have a tour through the gas turbine factory. As a group of maritime students, everybody was used to visit sites covered in dust and welding splashes, but at this company, the assembly shop was cleaner than the clinical technology department of our faculty. After taking the necessary safety precautions, the tour started at the smaller shops that take care of the smaller parts like pumps and smaller gas turbine parts. A couple of years ago, the site was completely revised to create a modern high tech construction floor. After having a brief explanation about the smaller parts, the group headed to the bigger maritime gas turbines, where the very enthusiastic engineer told us everything we wanted to know about the MT30. We had a chance to see a half fabricated MT30, only having the high-pressure compressor and high-pressure turbine installed and to see a fully installed MT30 almost ready for the testing phase.

At the fully installed MT30, we had a very interesting discussion about the coating of the blades, which is apparently totally different for maritime engines in contrast to aircraft engines due to the salt air the engine has to deal with. The engine we visited had a maximum power of 36 MW, but when changing the settings it would be able to reach maximum powers of up to 40 MW. Interesting to know is that when testing these engines, Rolls Royce is unable to deliver this power to the grid, because the investment costs in generators would be too high. So when Rolls Royce is testing a MT30 it is creating 40 MW transformed into heat by resistors.



Innovations that were going on at the moment were mainly focussed on reaching a higher maximum temperature at the first blades of the high-pressure turbine, since the maximum efficiency is directly proportional to the biggest temperature difference the engine can reach.

These gas turbines are still equipped with steel blades, but Rolls Royce is focussing a lot on research into ceramic blades to achieve even higher temperatures. To make sure the temperature can be as high as possible, the blades of the first stages after the combustion chamber are created from of one single metal crystal, better known as single crystalline blades. That way, creep (which is caused by high stresses and high temperatures) in blades is prevented as much as possible. Besides that, the blades are internally cooled by very tiny air canals inside the blade itself.

After the tour, and delicious lunch, Rolls Royce prepared three very educational presentations about Rolls Royce and gas turbines in general, the future of gas turbines, and about development in electric components on board. After some very interesting questions and answers about intercooling, recuperation, single stage gas turbines, DC grids, PWM controllers, power electronics, AC-DC converters, induction machines, and even about graduation opportunities, we returned to the bus to continue our trip to Southampton.

Green Marine

By Bart Diesveld

On the third day we went on our third excursion and visited Green Marine, located in Hythe near Southampton. We were welcomed by the CEO of Green Marine who gave an interesting presentation about Green Marine together with the chief of the engineering department.

During the interactive presentation we learned more about this state-of-the-art composite structures company. In their facility of 7000 m^2 they can make the most complex composite constructions. They have four build boxes of 38m x 11m that can be used as an oven with temperatures of up to 120 degrees celsius. The high temperatures are needed to cure constructions where prepreg fibres (pre-impregnated fibers) are used. When using prepreg fibres you buy sheets of fibers where the minimum amount of resin is pre-impregnated without weakening the composite. When you go for high performance and lightweight constructions, prepreg fibre is the best solution. Beside the build boxes the facility contains: two autoclaves, milling machines, and a laser alignment system for placing the fibres correctly.

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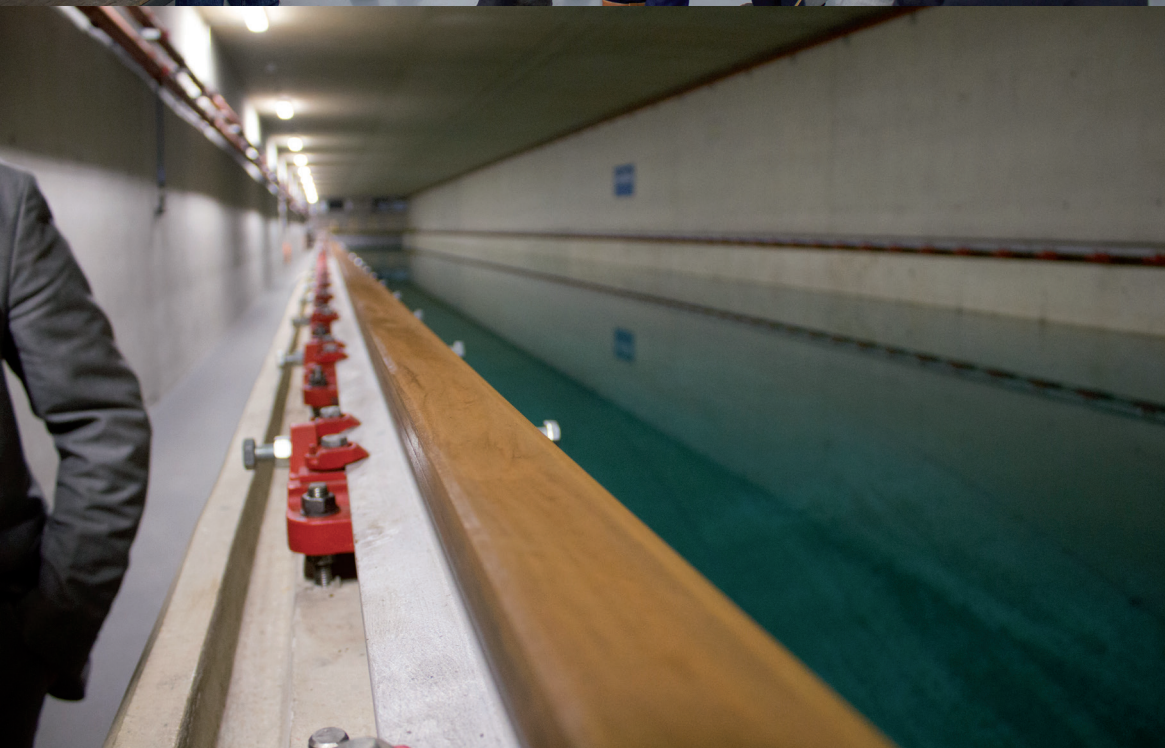
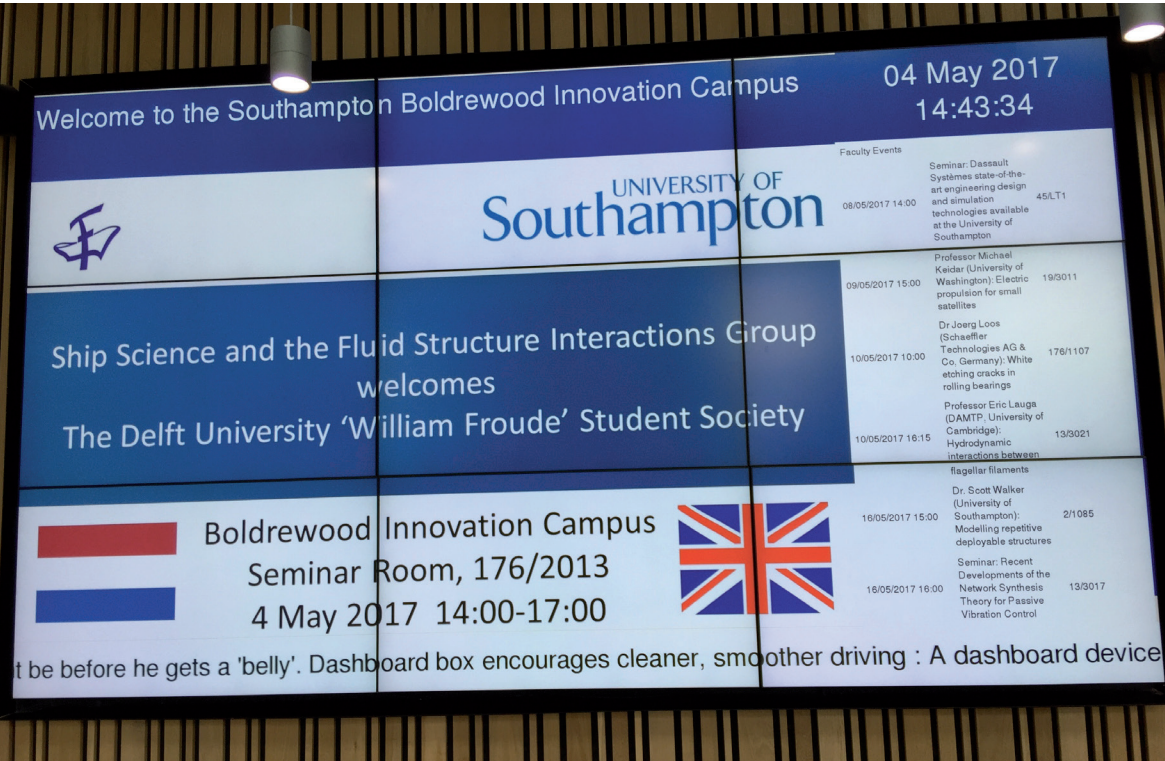


University of Southampton

By Léjon Zorn

When we left Green Marine on Thursday we had some lunch and continued our journey towards the next stop; The University of Southampton. We were received most kindly, a big announcement at the reception of our visit and a warm welcome by the staff. We would get a few presentations, a tour and drink afterwards.

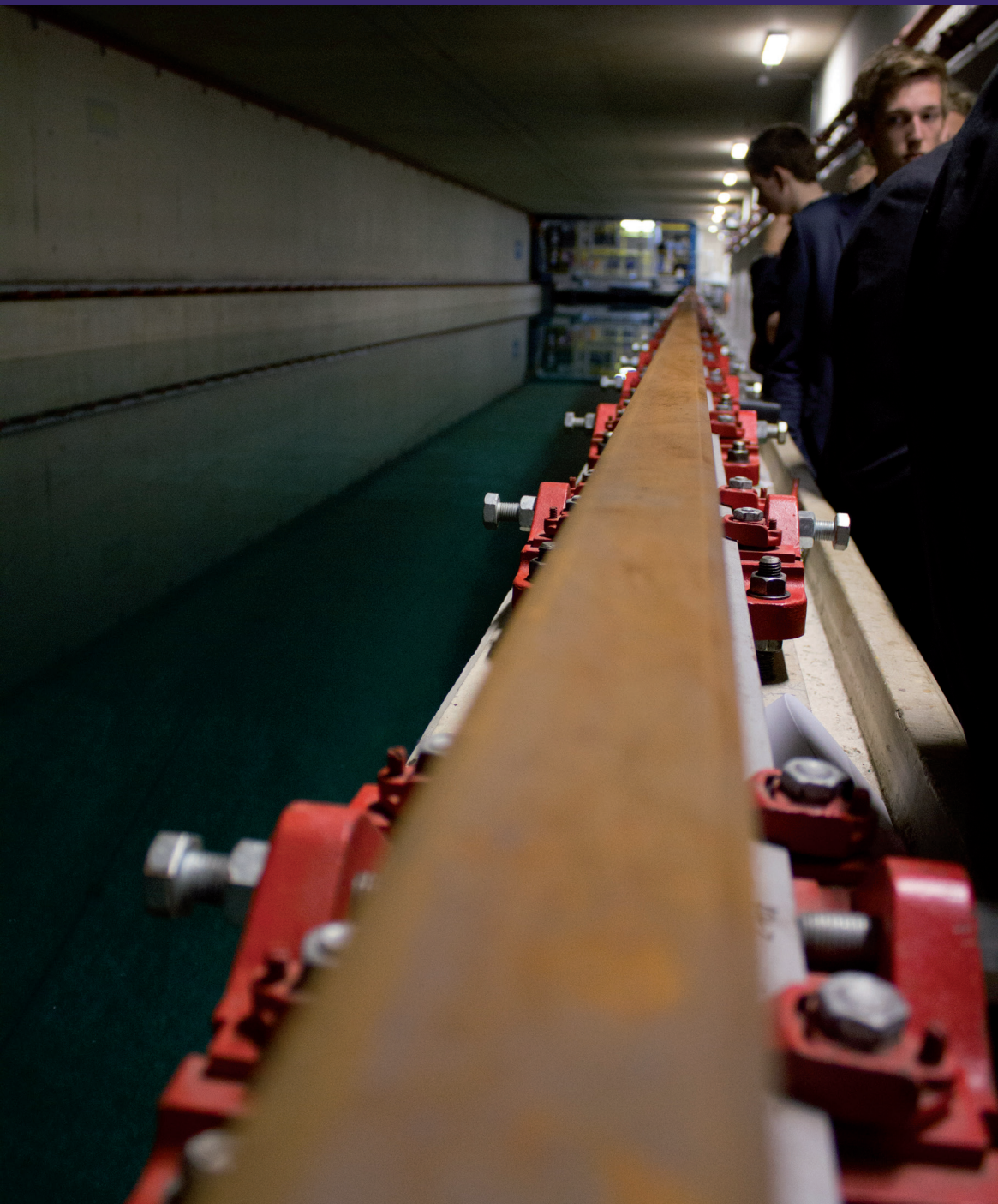
The location was renovated three years ago and that was noticeable. All the offices and research buildings looked neat. On the campus was also an office of Lloyd's Register, we would not visit them here in Southampton but the next day in London. Besides being neighbours the University and Lloyd's Register have very close connections. They support each other with new research projects which is no surprise because Lloyd's moved their hydrodynamic department to Southampton.



After our warm welcome a small introduction about the university was given. We were told that the new campus hosts a lot of state of the art research facilities, we would visit these in the tour after the presentation.

We split up into three groups and made our way around the campus. The tour took us through the several buildings, including a newly constructed towing tank. This concrete bunker hosted a really innovative towing tank. Unfortunate they did not have any runs with the towing tank, this was because they were still busy calibrating and verifying data.

Later on in the tour we walked past several workshops in which PhD students were busy working on drones for an undisclosed research purpose. These workshops amazed our students, this was due to the fact that the whole corridor was full of prototypes and scale models used for research. This gave the whole wing a futuristic look and an inspiring work environment.
After the tour we sat down again for a presentation about the Wolfson Unit. This unit has built up quite the reputation in the maritime sector, several large ship designers have used the experience of the Wolfson Unit. The unit is a team of professionals that advise and consult in the field of ship model testing, sailing yacht performance, and ship design software. However this is not the only field they are active in, they also have a lot of clients from the aerospace sector. The University of Southampton made a great impression on our students and maybe even made some of them enthusiastic about studying abroad.



Lloyds Register

By Dominique Smit

After a touristy bus ride through the city center of London, we arrived in the Financial District. Here we exited the bus and walked to Lloyd's Avenue, where the headquarters of Lloyds Register is situated.

Lloyd's Register is a classification society that started in 1760 in a local coffee shop, and grew to be one of the world's leading classification societies. Our visit consisted of a few presentations, and then a guided tour of their impressive office building in the City of London.

One of the presentations was led by Tim Slingsby, Director of Skills and Education at the LR Foundation, a charity organization set up in 2012, with a mission to protect life and property and to advance transport and engineering education and research. It is the sole shareholder of the Lloyd's Register Group. They give out grants globally which, until now, have added up to more than 100 million pounds sterling.

After this presentation, we got a guided tour through the Colcutt Building. We began with the explanation of the room that we were received in, the General Committee Room. This room is all about status, with the names of Watt, Newton, and Cook on the wall, and the saying 'They that go down to the sea in ships, that do business in
great waters; These see the works of the Lord and his wonders in the deep' out of the Book of Psalms. Marble, oak, the four elements depicted on the ceiling, and many paintings gave this room a powerful character.

We continued with an explanation of the first floor landing, where the bronze wall drawings depicted scenes of the development of the shipping industry from Viking longships to the 18th century. In between each scene is a maiden. These goddesses personify safety, navigation, registration, peace, justice, universality, shipping, and treaty. Another eye catcher on this floor was the bronze sculpture of a maiden on the stern of a barge loaded with goods. The materials used in this sculpture include Mother of Pearl and white Carrara marble. Afterwards, a marble staircase and entrance hall led us to the library on the ground floor. Here mahogany bookcases included rosewood and fruitwoods, and the ceiling was covered in the so-called “fish and chips”pattern. After pointing out some more unique sculptures that were offered as gifts and telling some more fun facts, our visit came to an end. It was really impressive to see so much history come together in one place, all centred around the topic of shipbuilding and commerce.

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IMO

By Tijs van der Zee

After an interesting morning at Lloyds IMO was on our schedule. IMO is the official Maritime Organization and is specialised in safety and security at sea. IMO is officially part of the united nations. IMO is in the middle of London with a front door on the bank of the river Thames. At the reception, the group quickly split up. In the large space there where models of ships on display. The models were gifted by countries. We were warmly welcomed for our tour through the building.

After the reception our next stop was the large conference room where the major voting for new legislation and guidelines in international waters takes place. To make it as fair as possible the counties are arranged by alphabetical order and are free to join the voting if they want. Far in the back the large shipping companies are located. While they are in the room they are excluded from voting. It was impressing to have the possibility to stand on the location where a great deal of the international regulations is made, even if this is not something discussed every day at the university and the awareness for IMO can be higher.

Leading the meetings in the front of the room were the chairmen (officially called chair by now), vice chair, secretary and others with an extra responsibility.

After a short briefing about the conference room and a short notice about a special program to join IMO as some sort of intern, all the questions were answered and all the photos were made. The tour continued to the hall on the first floor. At the first floor, most of the drinks take place. Because time was short we skipped the library which is called the MKC or maritime knowledge centre.

The presentation in a smaller conference room was riveting. The mean knowledge of IMO and the international regulations is much underappreciated. And behind the screens there is much more to it than the media generally shows. The presentation ended with our own tradition with the small suitcase which accompanied Froude on all its travels and secures the gifts.

The last stop was a beautiful view of the Thames and some of the more known attractions of London. From the roof terrace, you could see the London eye and the Big Ben for example. Because of this lots of pictures were made from this exclusive view. And this was the perfect view for an excellent group picture. Concluding it can be said that IMO is a necessary organisation to uphold the safety and security at sea.

Smulders Projects UK

By Gerben Dekker

On the final day of company visits, the majestic site of Smulders Projects UK was on the agenda. The general manager at Smulders Projects UK, Tom Coosemans, received all of us with a warm welcome. At the start of the visit, emphasis was put on health and safety. Working with expensive, big, and dangerous equipment makes the site a place full of potential hazards. It was for us students a good reminder of the fact that the structures we will design in the future also have to be built. And that one should think about safety and ease of building during the design stage.

After this initial safety briefing, the Smulders Group and its parts were presented. The different facilities in Belgium and elsewhere on the world were briefly introduced. Smulders, being a leading company in steel structures, has a very broad portfolio. Both non-maritime as maritime jobs were shown so all students could familiarize with the work Smulders takes on.

Of course, the greatest attention was gained during the presentation about steel maritime structures, such as the stinger of the Pioneering Spirit, wind farm foundations, and tidal energy constructions. The size, weight, and complexity of those structures spoke to the imagination for all that were present. Upon arrival at the site, large steel structures presented themselves on the quayside. Little did we know that those were only still parts of the total assembly.
As Tom Coosemans had requested, many questions were asked by the students. The colour of the wind turbine foundation for instance was bright yellow. The client had requested that those parts were painted in RAL1023, Traffic Yellow. Other questions involved connection types like welding, bolting, grouting or making use of slip-joints. Material properties were discussed, just as welding requirements like preheating and the testing of welds.

The visit of the site was next up on the program. The group was given a tour around the facility. All steps of production were run through in chronological order of construction. Starting at the 2D assembly hall, the small spaces were welders have to get in were highlighted. Next up combining the 2D assembly into an 3D construction was shown. Again, the fact that this can only be done outside at this facility brings challenges along. What these challenges were and how they are dealt with was explained. Lastly the large quayside crane was shown. How its place was determined and the cranes capabilities were highlighted.

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