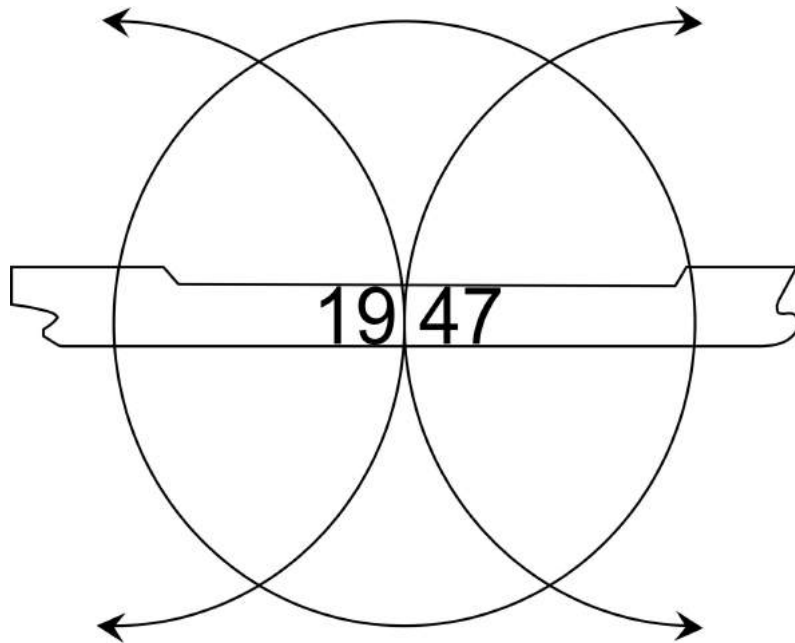


NUL-KRYDS

Field trip to Busan 2023



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1 Words from the President

First of all, we wish to express our gratitude towards our sponsor, the Danish Maritime Fund. Without them, the many experiences you will read about in this report had not been possible for us at all.

This field trip have been arranged in cooperation between the Department Fluid Mechanics, Coastal and Maritime Engineering and Nul-Kryds. Special thanks hearby to Ulrik D. Nielsen for ensuring that the trip became reality.

I can speak for the full delegation when I write that the trip have been a real success. The contribution of the trip towards our education as naval architects and maritime engineers have been wast. Seeing the wast dimensions of the vessels and experiencing the sort of "assembly-line"/ "Lego Brick" style ship production that is conducted in South Korea is remarkable. Alone the scale of ship yards need to be seen in reality as it can not be captured by a camera. It was also pleasant to see that working standards in both ship yards seem to be hold on high regards.

Perhaps even more remarkable are the cultural differences experienced, the working culture and the hierarchy structures are different from the Nordic compared to Asian countries. It was nice to see that the maritime industry in South Korea is also challenging the climate change and that we as a global industry are going forward to a more sustainable industry. This is an important point to realise as a naval architecture student. It gives motivation to work on improving the industry as we learn that we are not alone in the change.

I hope that the many positive experiences the group have had in Busan transmits through the written reports on the days of the trip described in the following report. The report on each day have been written in teams of 2-3 students and have allowed every member of the delegation to express their views on the experiences, why the different focuses of the individual participants also comes into light.

Best regards

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3 Travel Days

By Ali Asaad Jayyal and Mathias Rohde Markvardsen

3.1 CPH to BUSAN: The Journey Begins

After months of planning, our long-anticipated trip to Busan, South Korea, finally kicked off at 10:30 AM at Copenhagen Airport. It was a practical and efficient start to our adventure.

Our first flight took us to Helsinki, where we witnessed the autumn colors on our descent. This scenic view set the mood for our upcoming flight travels.

With full stomachs from snacks and enthusiasm running high, we boarded a 12-hour flight to Seoul. Typically, this journey would take 9-10 hours, but due to global complications, it stretched to 12.5 hours.

We landed in South Korea, tired but excited, and proceeded to Busan after making necessary arrangements. (Include a photo here, capturing the sense of anticipation.)



((a)) Seoul Scenery



((b)) Nul-Kryds Student Boarding towards Busan

At 8:00 PM local time, we reached our hotel. Most of us headed out to enjoy a local Korean BBQ, the first of many memorable encounters with local culture and cuisine.



Figure 1: Strolling by shortly after arriving

Our journey had just begun, yet we were already creating memories of beauty, culture, and shared experiences between us and the south Korean people. Next we would have to explore Busan city a little and then insightful days would be ahead of us on the different shipyards and companies.

4 Sunday

We started the day out by trying the exciting breakfast buffet at the hotel, where those who dared could try a classic Korean breakfast consisting of rice, kimchi and other savory dishes. For those who were less daring there was also toast and jam.

After breakfast the team for who had planned a program the day took us to Gamcheon Culture Village, which we walked to from the hotel, a nice and steep walk. In Gamcheon we could enjoy great views and exciting street food.



((a)) View over Gamcheon



((b)) Fish vendor at Jagalchi fish market

From Gamcheon Culture Village we went to see the Jagalchi fish market where we saw the vast amount of different vendors selling all sorts of aquatic creatures, both dead and alive. After roaming the fish market and the surrounding area the group met up at a restaurant where we enjoyed our first proper Korean dinner together.

To end of an eventful day we went to the very top of the Diamond Tower (Busan Tower), a needle like structure that soars 120 meters above its base which is already located above the surrounding city. Here we could enjoy views the of city at night.



Figure 2: Night view of southern Busan from the Diamond Tower

5 Monday

5.1 Changwon National University

Monday morning began with a traditional breakfast at the hotel. Subsequently, the group drove by bus in the westerly direction of Busan, with the destination being Changwon National University. Upon arriving at the university, the Danish delegation received a warm welcome and was escorted into a classroom. There, two professors from the university's maritime institute provided valuable insights into their current research, detailed the offerings of the university, and showcased its impressive facilities. Following the brief presentation, the professors led the group on a tour of the maritime department at the university. The first stop was a building equipped with a square wave basin designed for model-scale testings of all kinds of vessels. Some students demonstrated how they work with the wave basin and how the waves could be generated according to specific dimensions and directions. Subsequently, the group were brought to a spacious building, named the "Smart Factory", containing a multitude of rooms housing robotic equipment for e.g. welding, milling, and the production of microchips, among other technological applications. Many parallels could be made with the student workshop at Skylab. The visit ended off with lunch and bridge building together with some of the maritime students from the university.



((a)) Smart Factory facility



((b)) Square wave basin

5.2 Harbor tour

After visiting the Changwon National University the delegation was driven back to the city center of Busan. From the harbor, a boat was taking the delegation on a tour in order to experience the city from the seaside offering a unique opportunity to explore the city from a maritime perspective. This immersive experience provided insights into the vast scale of the city and its thriving maritime industry, offering a perspective that starkly contrasts with what one might encounter in Denmark.



6 Tuesday

Signe Groes-Petersen, Johan Magnus Hyllested Andersen, Sofia Maria Bava.

6.1 HHI tour

After indulging in a nice breakfast tuesday morning, the group met in the hotel lobby, all wearing safety shoes in anticipation of their tour to the Hyundai Heavy Industries shipyard. The excitement was noticeable as everyone looked forward to their engagement with the Korean maritime industry. Following an hour and a half on the bus, the HHI team greeted the group warmly. The tour began with a carefully well-organized exploration of the inspiring history of Hyundai and its visionary founder, Chung Ju-Yung, from Asan. The narrative of Chung Ju-Yung, once the eldest son of a humble farmer, who ultimately rose to become Korea's most successful entrepreneur by establishing the HHI shipyard, set a captivating tone for the day.



Figure 3: Group picture at HHI in front of the new Maersk methanol vessel

Upon concluding the historical tour, a luxuriously appointed bus awaited, ready to take the group on a journey around the shipyard. The satisfied participants could recline comfortably, enjoying in the breathtaking vision of the impressive shipyard and the seamless coordination of its workforce. The bus then ascended to a viewpoint, affording the group a panoramic view of the shipyard, and, of course, an opportunity for a group photography. Subsequently, the bus made its way to the engine workshop, granting the group the unique opportunity to walk through the manufacturing halls. Here, they could immerse themselves in the world of engines at every stage of development, from the intricate process of assembly to the final testing phase.

The final ride of the journey aboard the comfortable bus retraced the group's path, returning them to the reception area where their tour had initially begun. At this point, some of the group members couldn't resist the urge to purchase souvenirs, as a lasting memory of their extraordinary tour through the HHI shipyard.

6.2 Haedong Yonggungsa Temple and Haeundae Beach

We then proceeded to our own bus from which we got to enjoy an hour of wonderful Korean landscape, packed with orange autumn trees surrounding the mountains and sea. The destination of the bus was the beautiful temple of Haedong Yonggungsa, located by the sea north-east of Busan. The temple was a great view, located on the hillside of the coast, with a great horizon of ocean and cliffs.



((a))



((b))

Next and last stop of the day was the beautiful beach of Haeundae, where the local market provided plenty of different traditional lunch options such as cow blood soup, live octopus, and boiled pigs feet. After lunch, the group slowly gathered at the beach where the locals speechlessly watched and filmed us as we stripped down and went for a swim. For dinner, the we all ate Korean barbecue with the mandatory fermented side dishes, accompanied by personal preference of meat, freshly barbecued on the table by the staff. The last scheduled activity of the day was testing of the subway system, which was a complete delight as it was simple, fast and economy friendly.



Figure 4: Sunset view from Haeundae Beach

7 Wednesday

Andreas Ørgård Posniak Hansen, Rodi Habo Koyuncu, Dimitrios Bakis

7.1 Samsung Heavy Industries

Wednesday was with no doubt a very productive day in educational terms. The day started early as the group departed from the hotel at 7:30 am in order to be on time in Goeje where Samsung Heavy Industries is located. After one hour and forty five minutes of driving, the arrival was accompanied with some notices regarding the rural scenery... Samsung Village, Samsung Hotel, everything was Samsung related and at the epicentre was the shipyard. This comes naturally as SHI has a total workforce of close to 35,000 employees.

There was a small delay as there was a strict protocol regarding security when it comes to visitors. Everyone in the group had to leave their ID and have all the cameras of their cell phones covered in order to be admitted as visitors. Then a very easygoing Englishman, Jerry Ridgeon, welcomed us and gave us a tour alongside with a colleague of his. The bus drove inside the SHI plant up until the designnated viewing point which watches over the main dry docks. Mr. Ridgeon gave a thorough presentation about what was visible, ships that were under construction and the different ongoing stages, some technical details regarding their tugging when they are half-built in order the building of another ship which is in the same dry dock to enter its next phase! SHI can brag regarding the biggest dry dock in Korea, as it can host two full built ships one next to the other and at the same time two half-built ships in front of them.

Later the group had a tour in the Celcius office inside the SHI and a discussion regarding the safety issues this job has on a daily basis. After lunch which took place in SHI premises and after a short break Jerry gave a presentation related to different stages of building Celcius ships and shared his experiences of testing them. This was quite interesting, as Jerry was keen on replying to multiple questions that emerged from his presentation and conversations between him and the group lasted for a while as this procedure kept the audience engaged.

7.2 Afternoon Free Time

The day in SHI was long as the duration of the visit was slightly over 4 hours and the commute 3.5 hours back and forth and thus most of the people wanted to have some rest before the dinner. The group arrived at the hotel at 16:00 and after a couple of hours had dinner downtown and visited the city center of Busan which has been a lively place to wander around.

8 Thursday

Martin Agri Hansen, Peter Frithiof Buchbjerg Kroghsbo

After two days visiting shipyards and shipbuilding, on Thursday, we had the privilege to visit other parts of the maritime industry in the form of the two registration entities: Lloyd's and Korean Register. These were both located closer to the city center of Busan, so we did not have to go on a long bus trip for our visit. This meant we all met a bit later than the other days, at 08:40 in front of the hotel.

8.1 Visit at Lloyd's- and Korean register

Compared to visiting shipyards, the registration entities do not require safety shoes and helmets for their visitors, and the chance to get oil or dirt on your clothing is fairly small, so most of us met wearing shirts or polo-shirts. At first, we went to Lloyd's Register, which had an office in a tall building located right next to the port and the Busan Port Authority. In the building's lobby, we got a warm welcome from Mr. Gi-Hoon Choi, who was the Business Development Manager for Lloyd's Asia department, and his colleagues. They took us to the 10th floor, where the office was, and from there, we had a beautiful view over the central part of Busan and a great opportunity to see how important ships are for transporting goods, as many ships sailed near the port during our visit. At the office, Mr. Choi presented the business case for Lloyd's in Asia and told us what his and his colleagues' work was about. This was interesting, as many other companies are in the market in Korea, and the presenters had many great stories to tell.

After our visit to the office, we went on foot to a local restaurant nearby together with some of the employees from Lloyd's. At the restaurant, we were served traditional South Korean food, which was excellent, especially due to the fact that we were together with great people and had the opportunity to talk with them two by two.

After the delicious lunch, we jumped on the bus and drove to Korean Register where we had time for a small break before we were invited inside. Inside Korean Register we had an introduction to who Korean Register is, their history since they were founded and also general Korean naval history. It was very clear that the naval industry in Korea and Korean Register had been, and still are, rapidly developing. After the presentation of Korean Register, we were given an introduction to the International Association of Classification Societies (IACS), about who IACS are and how classification companies collaborate in making rules for different kinds of ships. Charles Choi, who is the director of International Business Development for K.R., was very keen on telling us, that he hoped some of us, might apply for a job at Korean Register in the future.



((a))



((b))

8.2 Karaoke evening

At evening time, the Planning-group had found a karaoke bar where we all joined for food, beer and music. In South Korea it is very unusual to only have drinks without food, so usually it's more a wine n' dine thing. It was a very fun and nice evening with lots of great karaoke and we discovered some persons in our group, who maybe should apply for X-factor or what not.

9 Friday

Magnus Strube Østergaard, Mads Holmgaard Jensen



Figure 5: Maritime Museum in Busan

9.1 Korea National Maritime Museum

The morning of the last day in Busan was spent at the Maritime Museum including a guided tour. An exhibition on 'maritime culture' and 'maritime history and figures' gave another perspective on the impact of the sea. The sea has many symbolic meanings in art shown at the museum and has also been of great importance for culture exchange. For example in diplomatic travels between Korea and Japan. The sea has been a source of life for centuries including food, trading, transportation and all kinds of related craftsmanship, and the aquarium had a focus on the beautiful animal life. Another exhibition with model ships displayed the technological evolution and impactful ships in a global context. They even had a viking ship.



((a))



((b))

The museum building was architectural impressive and gave a good opportunity to have a last view of the Busan skyline with a background of ocean and hills. Furthermore the museum was located next to 'Korea Maritime and Ocean University' which gave another confirmation of Busan as a maritime 'ecosystem'.

After a week full of impressions and experiences the group were getting ready to head towards Denmark and went with the bus from the museum to the airport.



Figure 6: Ancient Korean Ship for trade.

9.2 Home travel

The home travel was badly affected by unexpected difficulties. The planned travel plan were not possible due to a mistake in flight booking arranged by the travel agency and airline. This confusion gave a lot of waiting time and the solution was to split up the group into 4 different travel plans including a domestic train from Busan to Seoul instead of the planned flight and an extra night at a hotel in Seoul. 2 people came back to Denmark on scheduled time while the rest were delayed between 12-24 hours. The unexpected home travel gave the opportunity to experience a little extra. Like pastries in Seoul at a local baker/ café.

10 Sponsors



11 Financial

See separate financial report.