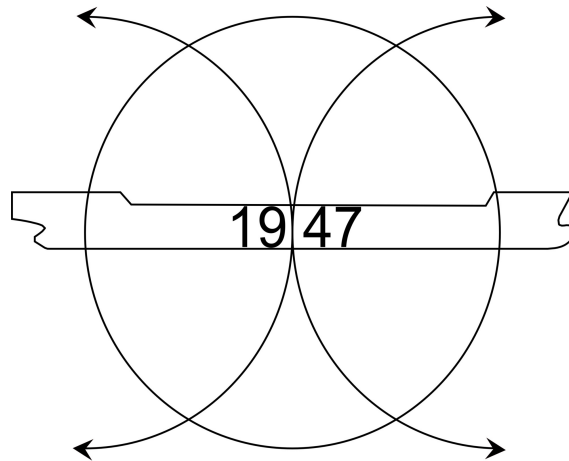


NUL-KRYDS

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# Annual Report 2016

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## Words from the President

The year of 2016 was a busy but exciting year for Nul-Kryds.

In December 2015 it was in cooperation with the maritime section at DTU decided to re-establish the yearly maritime study excursion to Asia. Nul-Kryds took the responsibility of organizing it and following extensive planning 25 students was in week 42 send to Singapore for a week of ship sightseeing. Ship yards, shipping companies and maritime research centres were visited. I am sure that all participants will benefit from both the new technological knowledge gained at the trip but also from the new social relations established.

The NTHS congress was this year hosted by the Stockholm delegation. 10 Danish delegated crossed Oresund to be enlightened within state-of-the-art yacht design, lightweight materials and alternative propulsion devices among other interesting technologies. Strong friendships formed during the week crisscross of the Scandinavian borders.

2016 was also the year where the maritime section at DTU hosted the 13th International Symposium on Practical Design of Ships and Other Floating Structures. Nul-Kryds was asked to assist in various practical matters both prior to and during the conference. The voluntary effort given by Nul-Kryds members was well acknowledged by the steering committee. I am proud that our union easily can set-up voluntary manpower for purposes that make a difference for our friends in the Danish maritime industry.

Lately, we were asked to move our union office and facilities to another location due to indoor restoration. At the moment our items are therefore stored in a small depot. Our office facility was well used by our members, so we are looking much forward to receiving the key to our new and larger room before this summer.

The following pages describe the activities that have been organized within Nul-Kryds during 2016. After reading the report you will hopefully have the impression that Nul-Kryds is not only a good social platform for DTU students with a maritime interest but also contribute to well-educated and motivated students. Enjoy the reading!

At last, I would on behalf of all our members like to express my gratitude towards all in the maritime industry, who have shown an interest for our student union during the last year; including sponsors, foundations and the maritime section at DTU. Hardly any of our activities would have been possible without your support. Thank you.

Jacob Rebien Johannesen  
President of Nul-Kryds

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# 1 Organization

## Resume of the General Assembly

The General assembly was held at DTU on October 11th 2016. Before the election of the Board, presentations were given about the events of the previous year and the work of the board. An outlook to the coming Nul-Kryds year was presented, in 2017 Nul-Kryds celebrates its 70th anniversary. The elected candidates are listed below. The bylaws were changed, so that the president and one other member of the board can enter into an agreement with the bank. This change was unanimously adopted. A large number of both DTU, international and Nordic Master students took part in the General Assembly and contributed to a good atmosphere throughout the evening.

## Board members

**Jacob Rebien Johannesen:** Elected as President. Jacob was re-elected as President. In his speech, Jacob talked about the previous year's achievements, for instance the Asia Study trip was successfully organized. Jacob is studying a master in Naval Architecture on his final year.

**Lina Barsøe Christensen:** Elected as Vice President. Because of an exchange program Lina has not previously been part of the board. In her speech, she advocated that she has experience from other student organizations and is happy, that she can finally be part of the Board. Lina is on her first semester of the master in Naval Architecture.

**Frey Callesen:** Elected as Treasurer. Frey has been elected for his third period as Nul-Kryds treasurer. Frey is studying the master in Naval Architecture and would like to continue his work for the Board during his final year at DTU.

**Harshit Tripathi:** Elected as first ordinary board member. Harshit has participated in most of the Nul-Kryds events held in 2015/16. For the coming year, he would like to contribute to coming events by taking on some work in the Board. Harshit is on his third semester of the master of Naval Architecture at DTU.

**Abhiket Kashyap:** Elected as second ordinary board member. Abhiket is a novice to Nul-Kryds. In his speech, he advocated that his experience from six years at a Japanese shipyard could help establish new contacts in Asia. Abhiket is on his first semester on the master in Naval Architecture at DTU.

**Philip Holt:** Elected as first substitute board member. Philip was part of the board last year and is currently on exchange in Munich, Germany but will be home primo March 2017. Philip will participate in board meetings via Skype and will work with events in the spring semester. Philip is on his fifth semester of the bachelor degree in Mechanical Engineering.

**Anna Joensen:** Elected as second substitute board member. Anna would like to partake in the board work. She has not previously been part of the board, but look forward to plan events that will benefit the maritime students at DTU. Anna is on her fifth semester of her bachelor degree in Mechanical Engineering.



Figure 1: The new Nul-Kryds board. From left to right: Abhiket, Anna, Harshit, Lina, Philip (on PC), Jacob and Frey.

## 2 Sauna Evening

With inspiration from our Finnish friends it was decided to host a sauna evening. This social event started after classes had ended and was initially hosted in the Nul-Kryds room, where some 20 current and former students showed up. Beverages were served and people made small talk to catch up on the state of each other. As this was the first social event of the semester this was also a good opportunity to meet the new international students studying maritime technology abroad. After socializing for some time and making sure everyone had showed up, pizza was ordered. The pizza was brought to the neighboring classroom where a long table was assembled to accommodate the participants. Following the nice pizza dinner, those who felt like it walked down to building 101's basement. People changed into their swimwear while the saunas were heating up. People went into the saunas, with plenty of fluids to keep them well hydrated. As the evening progressed and everyone had been to the sauna several times, the social activities moved on to the cellar bar in bld. 101. All in all this was a quite successful event, which we are planning to do again this year.

### 3 Visit to Scandlines and FSG

On the 5th of April 18 members of Nul-Kryds met early in the morning and headed towards Rødby to visit Scandlines, learn about their hybrid ferry concept and later on visit the yard Flensburger Schiffbau Gesellschaft, FSG, in Flensburg.

During the crossing from Rødby to Puttgarden with Prinsesse Benedikte the chief engineer kindly hosted a fine breakfast combined with a technical presentation of the hybrid system. First the considerations during the development and installation of the system were presented, followed up with a real time look at the system as the ferry left the harbor. During acceleration in the shallow water the system really showed its fuel saving possibility as lots of the required power were provided by the batteries. Following the presentation, the group went down into the engine room and had a look at the two generators running and the battery pack, taking up the space where a generator was installed previously. Many questions were asked, the cooling of the batteries gained much attention as well as the actual fuel savings. Compared to the first year of service in 1997 the fuel consumption was reduced to almost half the amount.



Figure 2: Morning fresh students ready to embark the M/F Prinsesse Benedikte.

After disembarking in Puttgarden the group drove towards Flensburg. As the group arrived FSG gave a security briefing, a few words on the yard's history and afterwards hosted a lunch in the common canteen on the yard area, a very nice experience. Afterwards the group moved through the steel cutting hall and had some perspective on the daily design work and calculations carried out at DTU. Moving through the halls the steel plates increasingly took shape into modules of up to 600 tons. Like the modules the group moved into the active assembly area where a RoRo ferry was taking shape. Many questions were asked regarding the precision in the manufacturing of the modules, the

assembly of these, to what extent finite element calculations were used etc. At the end of the visit the group headed to the outfitting quayside and had a look at the well stimulation vessels Siem Helix 1 & 2. Here stability and measures to increase or decrease this at the end of a construction were discussed along with opportunities for and benefits of working in the borderlands. After some boarder-shopping the group headed back for Copenhagen after a long but enriching and inspiring day.



Figure 3: The guided tour at FSG gave the students the opportunity of inspecting ship-building processes at short range.



## 4 NTHS

The 69th Nordiske Tekniska Högskolas Skibbsbyggare (NTHS) congress was hosted by Kongliga Skeppssällskapet from KTH Royal Institute of Technology in Stockholm during week 15 of 2016. During the congress, a wide variety of companies were visited along with fun-packed activities and interactions among the participants. Through the company visits the delegates explored the recent developments in the Swedish maritime industry focusing on state-of-the-art yacht designs, lightweight materials, underwater craft solutions and alternative propulsion devices, among other exciting technologies.



Figure 4: The Danish delegates inspecting a lightweight yacht design at Swedish Steel Yachts.

Some of the companies visited were: Rolls Royce-CP propellers production and cavitation tunnel testing facility, DolProp- Innovative dolphin tail shaped propulsion solution for vessels, Sandvik-development of light weight corrosion resistant super duplex steel, Swedish Defence Materiel Administration(FMV)-design of submarines and AUV's, Swedish Steel Yachts-a steel yacht prototype produced with super-duplex steel, James Fischer Defence-underwater vessels meant for special military operations.

The technical program at the congress was well mixed with socializing and relationship building with the delegates from other universities as well as 'old-timers'. As per tradition, the congress was concluded by a banquet on the last evening at a lavish aquarium banquet hall based in the middle of Stockholm with beautiful surroundings. The three course delicious dinner was preceded by speeches and presenting of maritime themed gifts to the hosts.



Figure 5: The Danish delegates and old-timers dressed up for a festive banquet.

## 5 Martha Evening

As previous years a much cherished event was hosted by Nul-Kryds: the Martha evening. A lot of energy was put into preparing the garden outside of building 402, to frame the festivities of this evening. This included maritime flags in the trees, the traditional table cloth depicting the good ship S/S Martha and much more. After all attendees had arrived the festivities were moved into a close by auditorium, where we watched the cult classic S/S Martha as always this involved plenty of cheerful songs. As tradition dictates O.P.Andersen snaps was readily available, as well as soda and beers. Later the activities moved out into the garden again, where the Nul-Kryds board had prepared a feast. The food included pulled pork, coleslaw and buns for building a nice burger. The festivities went on well into the night, leaving plenty of room for socializing with friends, colleges and other students. Also activities like anchor throwing and nail-games were practiced throughout the evening. We look very much forward to hosting the next Martha evening. We have no doubts that it will provide an equally good atmosphere and hopefully help the social environment on our line of education.



Figure 6: The nice weather allowed us to enjoy the well-cooked dinner outside.

## PRADS Conference

During September 4th -8th, 2016 the 13th International Symposium on Practical Design of Ships and other floating structures (PRADS) was held in Copenhagen. PRADS is an internationally recognized forum that provides maritime stakeholders the opportunity to present their ideas, design and research findings that relate to specific issues in the maritime industry. The symposium has been held every three years since 1977 and has generally seen participants from more than 20 countries with strong maritime traditions.

In 2016 the PRADS Symposium was for the first time hosted by DTU under Associate Professor Ulrik Dam Nielsen from DTU Mechanical Engineering. Organising a symposium at such a large level required significant tasks on the part of DTU. Nul-Kryds was asked to help in this regard by gathering some students to voluntarily help before and during the congress in exchange for complimentary participation in the congress. 8 members of Nul-Kryds were present during PRADS and helped with practical preparations before the congress days as well as assisting the speakers throughout the presentations during the symposium.

The efforts given by the Nul-Kryds team were well recognised by the organising committee and the overall symposium was a great success in further establishing Denmark as a leading maritime nation.



Figure 7: Presentation during the PRADS symposium held at the Crown Plaza hotel, Copenhagen.

## 6 Company Event

Company evening with the theme of "ECO-FRIENDLY SHIPS AND TECHNOLOGIES" was held by Nul-Kryds on September 26th 2016. The companies attending the event were

- GreenSteam
- OSK-ShipTech
- BIMCO

The evening started with an address from Jacob Rebieen Johannesen, the president of the Nul-Kryds board, welcoming the students and the people from industry.

The first talk was given by Daniel Jacobsen, CTO of GreenSteam, discussing fuel saving solutions for ship owners. The talk highlighted points which have been overlooked as a viable option for fuel saving. But in the current slump in the marine sector could be helpful for the owners to cut down on operation cost. The talk gave example of low cost solution of trim optimization and weather routing from its current projects.

After a small break of refreshments of sandwiches and beverages, followed the second talk of the evening, which was delivered by Anders Ørgaard, CEO, from OSK-ShipTech. The talk highlighted IMO's new regulations of IMO NOx Tier III requirements and the shortcomings in the method of EEDI calculation for ro-ro's. The talk also gave some insights of the projects the company has being undertaking in the field of design of green ships.

The last talk for the evening was delivered by Jeppe Skovbakke Juhl, Manager, from BIMCO. The talk was concerned with the Ballast Water Management, convention, BWM, and how differences in requirements of IMO and the US Coast Guard, USCG, would be affecting ship owners. IMO's BWM convention although adopted in 2004 was not ratified until recently. The long gap has not only ensured too many makers of Ballast Water Treatment Systems, BWTS, to grasp a big share on the business plan but also led to establishment of a different set of requirements by the USCG. The USCG regulations on ballast water management had already entered into force in 2012, interesting part being there are no type-approved BWTS makers complying USCG's requirement as of date.

The talks invited a range of questions from students also giving them first hand information of developments shaping the current marine sector. The company evening continued well beyond its stipulated time of 7:00PM. It gave time for students to develop network with people from the industry. And also gave moments of nostalgia for the speakers to relive their students' life at DTU.



## 7 Singapore excursion

Following two successful maritime study excursions to Asia in 2013 and 2014, it was decided not to organize a likewise excursion in the year of 2015. Nul-Kryds therefore took the initiative in 2016 to re-establish the study trip. It was decided that this year version should take us to the world's leading maritime capital Singapore. Hereby we could benefit of visiting shipyards and shipping companies and exploring state of the art technologies and research centres helping us to get a deeper understanding of methods and applications within the industry. This motivates us for continuing our track of studies to end up as future naval architects.

The Danish Maritime Fund, The Danish Society for Naval Architecture and Marine Engineering's Fund and Thrane's Fund sponsored the trip to lower the expenses for the 25 participating students. For that, we are very grateful. A thorough report on the excursion has been completed and can be found at our homepage. The following notes will only be a short summary from the trip.

### Monday

We drove to Tuas Yard right after breakfast, where we were lucky enough to spend the full day. The day started with a security briefing and presentations about Tuas Yard and the process of designing a Floating Storage and Offloading (FSO) unit. The presentations were in depth and very technical - much to the delight of the group. After the presentations, we went on a tour of the yard. The size of the yard and the countless workshops left a strong impression on all participants.



Figure 8: Group photo at Tuas Yard.

### Tuesday

The morning was spent at the start-up company C-leanship where we heard about the design a Remote Operated Vehicle (ROV) to perform hull-cleaning of merchant ships. After the presentation, we were shown their facilities and they launched their prototype for

the group to see it both in and out of water. We left C-leanship to visit Damen Shipyard. After a brief presentation of the company history we got a tour of the yard and saw the steel and aluminum hulls.

### **Wednesday**

We started the day at National University of Singapore (NUS) and after an introduction to the different study and ph.d. opportunities, we went to see the impressive test facilities at NUS. The afternoon was spend at Keppel Fels which specializes in the construction of Jack-up drilling rigs and highly specialized small craft vessels. After a brief introduction to the company the visit transitioned into a one hour long Q&A session. This was a great experience and many kinds of questions were discussed and answered.

### **Thursday**

The day was spend at Port of Tanjung Pelepas (PTP) in Malaysia - one of the largest container terminals in the world. The first half of the day was a mixture of presentations and relaxed conversations with the employees as we walked around the office and were introduced to different activities. After lunch at a local restaurant we went for a tour of the container terminal and onboard on of the vessels moored at the quay.



Figure 9: The group enjoying the view from monkey island on Maersk Klaipeda.

### **Friday**

Initially Friday morning had nothing scheduled but a last minute trip to Keppel FELS Shipyard was arranged and we were allowed onboard one of the stacked jack-up rigs. The group was shown around by the chief-engineer and tool-pusher, who gave an interesting introduction to life and work on board an oil-rig. The afternoon was spend at Lloyds Register Global Technology Center. We heard a number of presentations regarding their research and work in the field of CFD. One project had been done in collaboration with the Technical University of Denmark.

## 8 Tech Event

On the 15th of November the annual TECH event hosted by 'Det Blå Danmark' took place. Through the last couple of years it has become a tradition that Nul-Kryds participates and do a short presentation of what it is like to be a maritime student at DTU. The TECH event is for Bachelor of Science (da: bachelor, civilingeniør) and Bachelor of Engineering (da: diplomingeniør) students at DTU who might be interested in pursuing a career in the within the maritime industry. The participants come from many different lines of education, from the traditional mechanical engineering to product design or logistics. It is exciting to see that students with so different backgrounds express interest in the maritime field.

Nul-Kryds was present for the entire event, which featured networking sessions, presentations and a newly developed game "TECH game", it was fun to see the tech game in operation, because members of Nul-Kryds had previously tested a prototype version of it. During the networking sessions we got a chance to talk with the participants, suggest projects and companies that might suit their particular interests, and we of course hope to see a lot of them at coming Nul-Kryds events.

### Game night

In late october Nul-Kryds participated in a game-night to test the "TECH game" that was to be played by participants in Det Blå Danmarks 'TECH event'. The game should give an introduction to the many different aspects of and career opportunities for engineers within the maritime field. The "TECH game" is played in teams, it is fast paced and the players must relate to a lot of different material in relatively short time. In the end the team that chose a 'project leader' and divided the tasks to 'specialists' won the game, albeit scores were tight until the very end. After having been played, the game was discussed and several recommendations were given. For Nul-Kryds this was a completely new thing to participate in, but it was a very fun experience.



Figure 10: Nul-Kryds members guiding student colleagues at Tech Event.



## 9 Christmas Lunch

The 11th of November 2016 was the day of the annual Christmas lunch – the best time of the year. Around 40 people showed up for the festivities! For those who got off early, the doors opened at 16 o'clock. The event was held at Saxen, Kampsax' bar. The evening started with mingling, "glögg og æbleskiver" at around 16.30.



Figure 11: Students gathered around a game of "Sink the Ship".

The best part about the Christmas lunch is the atmosphere. Everyone is welcome, new members as well as old-timers. It is the perfect chance to get reacquainted with old friends and make some new ones. No one is left out. No one was sitting sad in a corner – everyone was having fun - smiling and talking to each other. In the hours before the main course was served, games were played, both "Sink the Ship" and foosball were particularly popular.



Figure 12: The feast is served.

The main course was a traditional Danish Christmas lunch menu: roast pork with potatoes and sauce, hot “leverpostej”, herring, meatball eggs, shrimps and salmon. The desert offered quite the surprise: Two of the organizers are from India, and they had never made “Ris ala mande” before. The almonds were had not been chopped, before being added to the “ris ala mande”. So when people started eating, everybody got ‘the almond’. The game had changed – the one who got the most almonds won the “mandel gave”. The winner got 37 almonds (with help from some friends, we hope)!

The fun lasted all night long, and everybody had a great night and loads of memories.



Figure 13: Both old-timers and students gathered for a cheerful evening.

## 10 Plans for 2017

2017 will be a busy year for Nul-Kryds. The board is working hard to ensure interesting activities for our members. In that way we hope to contribute to keeping the student's focus towards the maritime industry. A range of activities has already been planned and more are in the pipeline. A few of them will be highlighted in this section.

Nul-Kryds is currently aiming for a two-day study trip to the northern part of Jutland to visit maritime industry in the area. A lot of major Danish maritime technology companies are located here and for that reason we are sure that such an opportunity would be highly appreciated among our members and we hope the same goes for the companies we will visit.

This year the 70th version of the NTHS congress will be held in the Trondheim area of Norway in late March. The 10 Danish delegates are looking forward to visit Norwegian maritime industry. In 2018 the congress will be organized and hosted by Nul-Kryds. Therefore we will already by April start the planning including looking for sponsors. It is a major task for a small voluntary driven student union and therefore we will welcome all the help we can get from the Danish industry.

In 2017 Nul-Kryds can celebrate its 70th anniversary. We are always looking for a good opportunity and reason to celebrate and party so this occasion will not be wasted. How the celebrations will be conducted has not been decided on yet. But our plans are to invite everybody with a relation to Nul-Kryds for a festive day.

Thanks to our sponsors

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