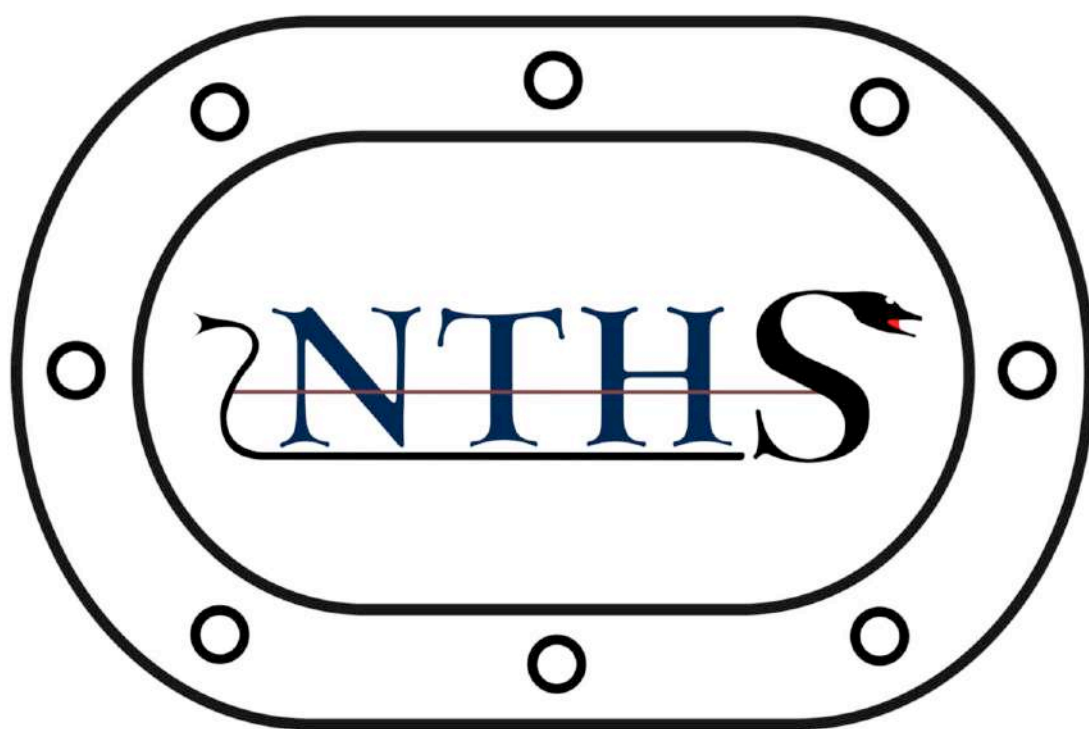
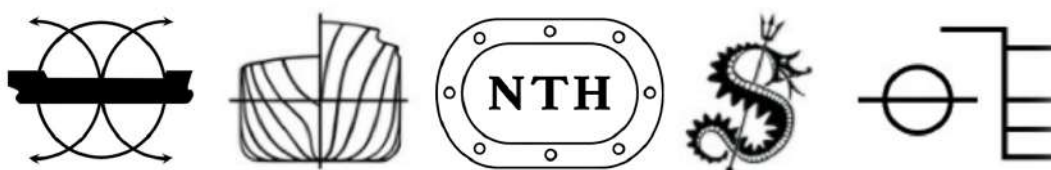


OFFICIAL REPORT 71st NTHS



THE NORWEGIAN DELEGATION
DENMARK 2018



WORDS FROM THE PRESIDENT

The 71st NTHS is now over, and what a great experience it has been. Our Danish host had planned an impressive and varied program for us. During the congress we visited in total 6 cities, 11 companies with an additional 6 company presentations. We've experienced a full tour of a modern Naval Warship, seen the vast dimensions of a six-legged jack-up vessel, inspected a state of the art fishing vessel under construction, felt the shock waves of a 4-story high two-stroke diesel engine from 1932, and so much more.

During daytime we had full days of company visits, lectures of new technology, vessel optimization and the do's and don'ts of shipping and retrofitting from Skagen to Copenhagen. One might expect that the hours spent on a bus crisscrossing Denmark with 40 strangers in five days would be dull, but I can speak for all participants when I say we've had a blast. In between the scheduled program and at evenings we had bus-speed-dating, games, social activities, anecdotes, great meals, Danish beers and a banquet with returning Oldtimers. Student traditions, countless songs and stories have been shared. Traditional Danish meals, struggles to keep awake during the early morning presentation in thick rural Denglish, smiles, and laughter have been shared. And hopefully, some long lasting friendships created and bonds forged between potential future colleagues.

Coming from Tyholt where Oil & Gas, and Aquaculture dominates it has been very interesting to learn about the Danish maritime industry and also see a maritime career from the perspective of our Danish equivalents. I would like to express my sincere gratitude to all sponsors who made this trip possible for the Norwegian delegation. Also, thanks to our Danish hosts and all participants.

On behalf of the Norwegian delegation
Best regards,

Amund D. Helvik

President NTHS, Mannhullet





WÄRTSILÄ

THE NORWEGIAN DELEGATION



Amund D. Helvik



Simen Mildal



Ingrid Mehn-Andersen



Tom-Erik Abildgaard



Mari Jensen



Bjørn Børresen



Matias Bøe Olsen



Frida Mattson




Marius Robsahm



Hedda Sofie Sjøvaag

PROGRAMME

Monday 26/2/2018	Tuesday 27/2/2018	Wednesday 28/2/2018	Thursday 1/3/2018	Friday 2/3/2018
MAN Diesel & Turbo	Karstensens Skibsværft	Swire Blue Ocean	J. Lauritzen	Maersk
				OSK
The Royal Danish Navy	Alpha Laval	Viking Life Saving Equipment	DFDS	Force
Ørskov Yard		Drive to Odense		Lloyds Register
		Fayard		Knud E Hansen
	Drive to Esbjerg	Drive to Copenhagen	DieselHouse (MAN Diesel & Turbo) (not confirmed)	Norden
		Anecdote night at Clipper		Banquet


NTHS71 Schedule – Denmark 2018

Skipsteknisk



– freedom to create

MONDAY 26th OF FEBRUARY

The first full day of the congress took place in Frederikshavn, and naturally all the bus rides were quite short. MAN in Frederikshavn had the honor of being the first company to receive a visit. Uffe Sjølund Freiburg gave us a brief overview of his Ph.D. work with MAN on Wake Pitching Propellers. He was quite enthusiastic and we were all intrigued by his work. A few more presentations of various propulsion related topics followed and we were left with a good impression of the work that MAN does in this field. After the presentations it was time to take a look at the training center located at the premises. The training center consisted of various engines, shafts, ++ that MAN service personnel would get quite familiar with before working in the field. The visit ended with a nice lunch of sandwiches, coffee and soda.



Next on the schedule, Ørskov Yard. Having a great history as a traditional new build yard, building some of the vessels that Scandlines now have converted into hybrid ferries, Ørskov have restructured as a repair yard only during the 00'es. Ørskov utilises its position close to the Norwegian North Sea sector and the low cost of skilled labour in Northern Jutland. After the oil price drop Ørskov have diversified its business.



We were lucky to be given access to visit the impressive Frigate, Esbern Sanare berthed longside in Frederikshavn. All participants were curious about everything from weapons system to life on board during International Operations. A Naval Officer tried his best to reply to all our questions, and gave us an extensive tour of the ship.

At the evening we gathered at the local restaurant Moby Dick for dinner and drinks.



Department of Marine Technology

Three horizontal bars of varying colors: a light blue bar at the top, a green bar in the middle, and a dark blue bar at the bottom.

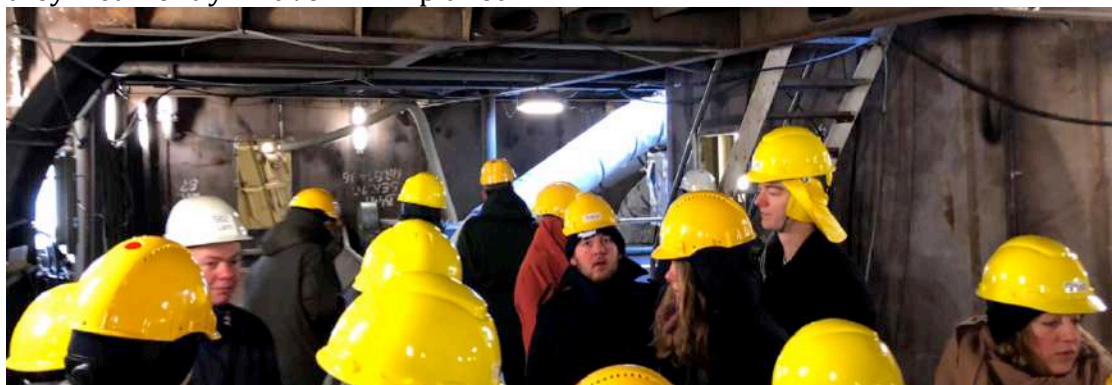
DNV·GL

TUESDAY 27th OF FEBRUARY

Tuesday started with a drive from Frederikshavn to Skagen where Karstensen Skibsværft is located. Currently Karstensen's Skibsværft is the largest newbuilding yard in Denmark. The primary focus is larger fishing vessels, and in recent years the latest series of North-Atlantic inspection vessels for the Royal Danish Navy. In addition to newbuilds, Karstensen performs a lot of repair and conversions jobs. We are told they usually have 180 repair jobs during a year, and that they currently have 14 planned

newbuild fishing vessels in the future. With its strategic location close to the North Sea and North Atlantic ship lanes, Karstensen has a very international customer base.

We were lucky to get a tour of the yard, including boarding one of the large fishing vessels under construction, Serena Walsøy. At the yard they have facilities for vessels up to 135m in length, both for newbuilding and dry dock. Most of their hulls are delivered from the Netherlands.



Alfa Laval took over the surviving boiler producing part of the former "Aalborg Industries" in 2010. Nowadays not only boilers are developed and produced in Aalborg but also scrubbers, ballast water treatment plants as well as fuel heaters are developed and to some extent produced in Aalborg. We are given a thorough introduction to boilers and scrubbers, and how new international maritime regulations will change the shipping industry. The highlight of the visit at Alfa Laval was the tour in their modern Test and Training Centre. In 2014 Alfa Laval opened their test center

for maritime equipment from the whole group, and in 2016, the test center was extended substantially focusing on the development on technology for green shipping. Today the facility is built up like a complete engine room, holding every component for a functioning engine and connected systems like boilers and scrubbers.

From Frederikshavn via Skagen and Aalborg, the day ended in Esbjerg where we were served the traditional Danish dish Brændende Kærlighed (mashed potatoes and bacon) at a local restaurant.

WEDNESDAY 28th OF FEBRUARY

Esbjerg, the Offshore capital of Denmark. The city has have strongly marked it's position as the place from where wind turbines in the shallow southern part of the North Sea are shipped and maintained. This focus on offshore wind has helped the city though the hard times of low oil prices.

Our day started with a visit to Swire Blue Ocean, a Danish shipowner focusing on installation of offshore wind turbines, and oil and gas decommissioning. The company presentation takes place on the enormous six-legged jack-up installation vessel Pacific Orca. The vessel has 60 meter legs, and a main crane capacity of 1200 tons. During our visit the vessel is on a short conversion while preparing for a new offshore wind turbine installation campaign.



Viking Life Saving Equipment headquarters started in the 1960, focusing on saving the lives local fishermen. Today Viking is a globally recognized supplier of lifesaving equipment. We visited the local production, and presented the brand new mass evacuation system designed for cruise ships.



Arrival at Fayard in Odense. Sales Manager Ivan Larsen gives us a presentation of Fayard how they evolved from a small-scale boat builder yard to a large, modern and efficient repair yard. The yard has a total of 4 dry docks, large quays, cranes, and workshops making Fayard capable of serving jack-ups, semi subs and vessels of all sizes. Ivan teaches us the philosophy of periodic vessel service, and how their strategic location in Odense gives Fayard a good advantage.

Last item on the program was Anekdot Night at Clipper in Copenhagen. Firstly we were given a short company presentation from two former NTHS participants of Clipper-Group and the dry bulk shipping industry. Then all the participating universities held an anekdot of "The future of marine industry"

THURSDAY 1st OF March

The day started with breakfast at the hotel and a visit to J. Lauritzen. J. Lauritzen is a traditional Danish ship owner especially known for operation of reefer vessels. Nowadays J. Lauritzen operates within the field of bulk carriers and liquefied gas carriers. J. Lauritzen operates a large fleet of both own and chartered vessels. Mads Peter Zacho, CEO of J. Lauritzen, and Sverre Patursson Vange, Head of Performance Management, held an informative presentation about the company, their proud history and their vision for the future. Sverre informed us about auto logging, and how "We can't manage what we cannot measure".

Next stop was DFDS and their boat Pearl seaways. We were met by the old Nuld-Krys president, Jacob Johannesen, who now was working as a Naval Architect for the company.



DFDS is a major player within short sea shipping in Northern Europe, its main competitor being Stena Line. DFDS operates mostly RoRo-Cargo vessels but are well known for the passenger route between Oslo and Copenhagen as well as on the English Channel after the take over of Norfolk Line from Maersk.

Jacob explained how DFDS now are focusing on fuel saving measures using machine learning instead of CFD and modeling. This includes conducting trim optimization, monitoring hull

performance, monitoring engine performance and predicting fouling.

The director of newbuilding, Jesper Aagesen, gave a brief presentation of DFDS's newbuilding projects. As many of their ships are starting to get old, DFDS are now investing a lot in expanding their fleet, having 6 ships under construction in China and Germany. Lastly we got a lovely tour of the ship, visiting the bridge, engine room, control room and more.



The last stop of the day was MAN Diesel house, a combined museum, company showroom and pensioners club hosting and preserving the vast knowledge collected during the years at B&W Diesel, later MAN Diesel & Turbo. We were given a presentation about the 2-stroke diesel engine from one of the company's top experts on hull/engine interactions, Bernt Ørndrup Nilsen. We also got the pleasure to see the gigantic B&W 2000 diesel engine (see picture) in action. This engine was, until 1966, considered the largest diesel engine in the world.

After the company presentations a traditional Danish dinner was consumed, before heading of to Heidi's Bar to meet the returning Oldtimers.

FRIDAY 2nd OF MARCH

Friday morning started at DTU campus, where several of the local companies had prepared speed presentations for us.

First out was Maersk Line, represented by Lead Naval Architect Kasper Jensen. His firm specializes in project management and engineering within newbuilding projects, retrofit projects and operational support. Kasper introduces us to the philosophy of Hull Optimization, with focus on hull, propeller and rudder design. They apply both model test and CFD frequently in their process for optimizing ships for designated route, weather and speed.

Henrik Mikkelsen from OSK - ShipTech presents the OSK toolbox where the key tools are CFD and STARCCM+. OSK Group is today one of the biggest Consulting Naval Architecture companies in Scandinavia and working for biggest companies in the Marine and Offshore Wind business on an international scale.

Force Technology invites us to their offices, located a short walk from campus. We are given an interesting tour on the site, with numerous ship models, simulators and a 250m towing tank. To our amusement, Force has prepared a beer tournament between the nations.

Back at DTU campus, Lloyds Register represented by Aleksander Hamdan. As an active NTHS participant and Oldtimer, Aleksander gladly digressed from time to time during the presentation about noise and vibrations with short stories of his NTHS experiences.

Kenneth from Knud E. Hansen A/S introduces us to their involvement in design solutions for marine vessels and offshore structures. In cruise ship design they have started utilizing Virtual Reality to optimize user experience with regards to appearance, comfort, safety and efficiency. In addition we are given a short introduction to RoRo and RoPax design.

Final presentation of the day is given by Norden A/S. Thomas Lindberg is a Performance manager at Norden, and gives us an introduction into his work involving daily performance Evaluation in global tram shipping.

Friday evening all NTHS71 participants and returning Oldtimers from all nations and age groups gathered for the annual NTHS Banquet. An amusing evening with excellent food and drinks, speeches, dancing, new friendships, old friendships, and always hilarious and impractical gifts for the hosts.

The Master of Science in Marine Technology 2-year Study programme



NTNU – Trondheim
Norwegian University of
Science and Technology

We are looking for people who want to challenge the ocean to improve human life.

Through all times, the ocean has challenged human beings. In the ocean we find the resources that have made Norway's maritime industries grow fast. By using knowledge from marine technology, your imagination, creativity and sense of adventure, you can take part in this exploration. Those who want to join us have many exciting tasks and challenges ahead. Science always has an opening for new and better solutions to existing problems.

WHY CHOOSE MARINE TECHNOLOGY?

Do you want to challenge the ocean to improve the life of the world's population? The Marine Technology study at NTNU is your choice. We wish you welcome on board. The Marine Technology Centre (MTS) at NTNU in Trondheim is the largest research and educational centre of the marine industry in the western part of the world. Students are participating actively in international marine research projects. If you are thinking globally, are willing to push boundaries by using your imagination, creativity and environmental awareness, and appreciate working with people from different countries, the marine industry wants you.

CAREER PROSPECTS

The marine industry is characterised by varied tasks, high activity and large investments. The need for skilled people is great. Most of our students have received a work position before they graduate. A majority of new employees complete an internal training programme and several are employed as trainees. As a trainee you will be working while you are being trained. Contracts usually last for up to 3 years and include a longer stay abroad (Brazil, China, the Persian Gulf, the USA etc.).

FEEDING THE WORLD'S POPULATION

Norway is the second largest exporter of seafood, thanks to the wild catch resources and growing aquaculture production in the sea that surrounds us. These marine resources are among the richest in the world. The seafood production is based on renewable resources and it will make a breadbasket for the world's population for perpetuity.

UNIQUE LABORATORY FACILITIES

The NTNU Department of Marine Technology is located together with the research environment MARINTEK, which is well reputed internationally. The NTNU has huge marine laboratories that are made available to the PhD and master level students at the Department of Marine Technology. These laboratories are the Towing Tanks I and II, Student Towing Tank, Ocean Basin, Cavitation Tunnel, Circulating Water Tunnel, Marine Structures, Marine Cybernetics, Hydrodynamics and Machinery Laboratories.

STUDENT ENVIRONMENT

The NTNU Department of Marine Technology is known for its fantastic student environment. The fact that marine students have their own campus at Tyholt is probably one of the reasons why strong ties are made between the students at the marine technology study programme. The Marine Technology Centre (MTS) has its own library with marine technical literature available. In addition, students have their own computer labs, study rooms and seminar rooms. For the last year of the study programme, students are given student offices at the Centre. The student association "MANNHULLET" is run by the students and it offers great friends and great fun. It also organises meetings with representatives from the marine industry, so-called business presentations.

Read more about the study programme at: <http://www.ntnu.no/studies/msn1/>



MANNHULLET

Est. 1917

The Norwegian Delegation represents *Mannhullet*, the student association at the Department of Marine Technology at the Norwegian University of Science and Technology (NTNU) in Trondheim.

Mannhullet is a very central part of the student lives of those seeking marine engineering for the future. Leisure time can be spent on the sailing boat *Steinbitten III* or the motorboat *Havfruen V*. These boats also give the students experience with the sea – an element that every marine engineer must master.

Social gatherings, such as quizzes, company presentations, sports on TV and those crazy parties only marine students know how to make are situated in Mannhullet's basement *Skipslogen*. Every year there are festivals such as *Tyholt Rock Festival*, the *Regatta* or *RUKA*, and the cabaret of *Mannhullets Interne Teater (MiT)*, which are highlights of the semester.

But beer contains calories, and for those who want to burn it away Mannhullet has a gym at the Tyholt Campus called *Kraftgangen*. The sporty students of Mannhullet have access to a range of wildlife equipment, and annual trips to the woods and the mountains have become a tradition. Mannhullet also has two football clubs, *Marin FK* and *Marin FKK*, for women and men. The supporter club, *Bulben*, contributes to a good environment at the football matches.

There are constantly things going on in Mannhullet, and the choir *Tåkeluren (The Fog Horn)* makes every gathering unpredictable. Luckily, the marine students have the newspaper *Marina* to keep track of it all – especially the gossip.

Mannhullet consists of the following sub-groups:



COMA

This group is responsible for trips to the great outdoors. They arrange cabin trips and hiking trips to keep the marine technology students' active.



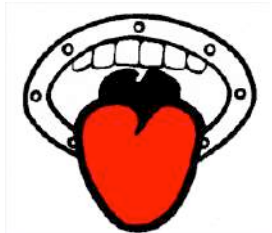
SKIPSLOGEN

Almost all student unions in Trondheim have their own bar, but our is indisputably the largest and the best.



MiT - MANNHULLET'S IN-HOUSE THEATER

One show every year, always sold out and always a huge success! The members of the Mannhullet board are always part of the jokes...



TÅKELUREN

Our own maritime choir. Highly energetic, not choreographed, not talented, but extremely charming. They managed some years ago to get thrown out of a choir festival, so now they participate in band camps instead.



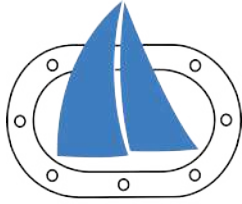
MARINA

The newspaper for the students, by the students. Gossip and rumors true or untrue, it's all in there. If your name is mentioned, it's never a good thing.



THE MOTORBOAT COMMITTEE

Havfruen V is our own motorboat, which was purchased new this year as a gift to ourselves for our 100th anniversary. It is used for maritime activities such as waterskiing, diving, fishing, swimming and tanning (when the weather in Trondheim allows for it).



SEILBÅTKOMITÉEN

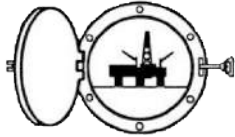
THE SAILBOAT COMMITTEE

Yes, we have our own sailboat, Steinbitten III. It is a Hanse 370, new in 2006, and we are very proud of her!



MARIN FK & MARIN FKK

We have very good athletes in Mannhullet, which are represented by our two football teams for male and female students.



BK - INDUSTRY CONTACT

Bedriftskontakt, BK, arranges company presentations where companies present themselves for the marine technology students. They are also active in advertising summer internship, and occasionally arrange excursions.



BRYGGELAUGET

Our own beer brewery committee. Bryggelaugget teaches the art of brewing to thirsty students, and regularly brews beer to be sold at our basement bar for a decent student price.

STATUTES OF NTHS

Regulations of NTHS as approved by the board of the 70th NTHS congress hosted by Mannhullet, Norway in 2017

§1. *The name of the association is "NORDENS TEKNISKA HÖGSKOLORS SKEPPSBYGGARE".*

§2. *The members of the association are composed of students from the following universities:*

- *Danmarks Tekniske Universitet (DTU), Copenhagen*
- *Chalmers Tekniska Högskola (CTH), Gothenburg*
- *Kungliga Tekniska Högskolan (KTH), Stockholm*
- *Norges Tekniske Naturvitenskaplige Universitet (NTNU), Trondheim*
- *Alto University, Helsinki*

§3. *The purpose of the association is to improve the contacts between the members and to act as a provider of knowledge in ship building in the Nordic countries.*

§4. *The board of the association consists of 10 members. Two from each delegation, chosen by student unions.*

§5. *The Congress*

- *Every year a congress is to be arranged in one of the four Nordic countries. Each university hosts the congress every fifth year.*
- *Each university is allowed a delegation of ten participants. The host university may allow more participants if desired.*
- *The congress must comprise of:*
 - *Presentations followed by discussion and excursions to laboratories, shipyards and other industrial enterprises.*
 - *A board meeting with the board consisting of the chairman and vice chairman of each delegation. The following issues will be on the agenda:*
 - *The President of the following year shall be introduced for the board*
 - *Determination of place for the next congress*
 - *Probable changes in the rules*
 - *Invitations must be sent no later than two months prior to the congress. A preliminary schedule should be attached.*

§6. *The official language of the congress is English.*

§7. *A member fee cannot be demanded. To cover costs for the congress it is however possible to collect a participant fee, which must be no more than € 300. The association may not take on economic responsibility.*

§8. *When electing a new chairman at one of the universities the other universities should be informed as soon as possible. The latter also applies for changes in names, addresses and/or telephone numbers*

WORDS FORM THE NEXT YEAR'S PRESIDENT

I want to start off with congratulating the Danish delegation on hosting an exceptional congress. The last year's delegation from Norway had a memorable week where they were presented to the Danish maritime industry.

We are already looking forward to next year's NTHS congress in Sweden. Confident that our Swedish hosts are planning an interesting week, providing insight to the local industries and creating new bonds with our future Nordic colleagues.

The Norwegian delegation traditionally consists of 3rd and 5th year students. Five lucky 3rd graders have recently been elected, from the many applicants to join next year's delegation. We are excited to meet the newcomers from all delegations, and also hope to meet the graduate participants at next years banquet among the returning Oldtimers.

Finally I would like to show my gratitude to our partners over the years. Whom without the annual NTHS congress would not be possible, and hoping for future collaboration.

Best regards,
On behalf of next year's NTHS delegation

Mildrid S. B. Haga

President NTHS 2019, Mannhullet.

