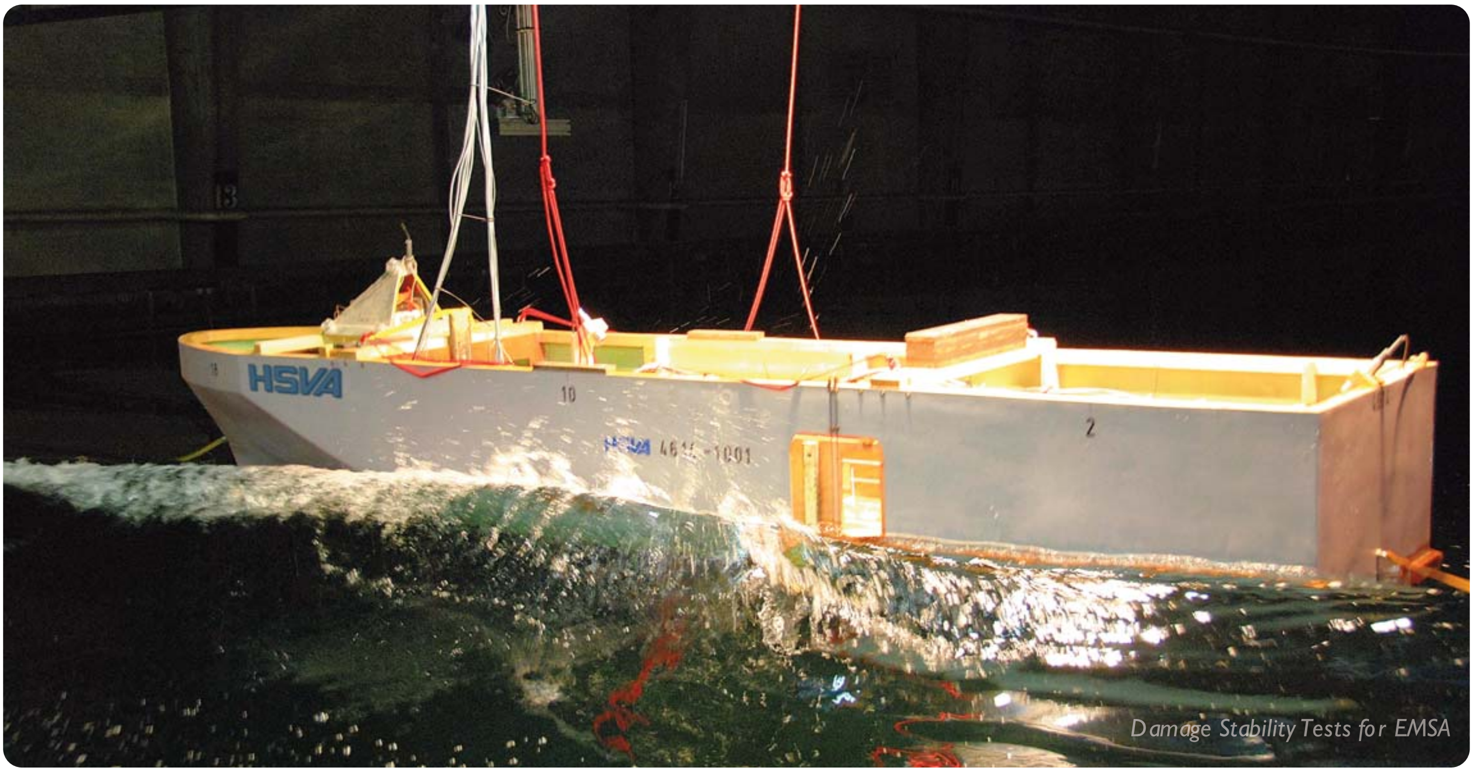
HSVA Newswave 2010/2

THE HAMBURG SHIP MODEL BASIN NEWSLETTER



Damage Stability Tests for EMSA

IN THIS ISSUE:

Dear reader,

A warm welcome to our second edition of Newswave this year. With this Newswave we would like to invite you to meet us at SMM 2010 in Hamburg at our booth no. 260 in hall B4, where we will present an outline of our latest developments.

The first half of 2010 was a quite challenging phase for our model basin, with some cancellations and many rescheduling of projects to the second half of the year. Now, with the improving economy and the increase in transport volume, business becomes very active again. Our customers should note that we are again almost fully booked till the end of the year which makes it rather challenging to meet additional demands of our services. We try to be even more flexible than in the past, in order to accommodate all your expectations within a short time. As the past 18 months have shown, next-generation ships will have to be much more efficient to enable the shipping business to respond flexibly to changes in the market.

We will do our best to find optimum solutions for all your hydrodynamic questions to make your product a success, and it is our vision to always justify your confidence in our experimental and numerical work.

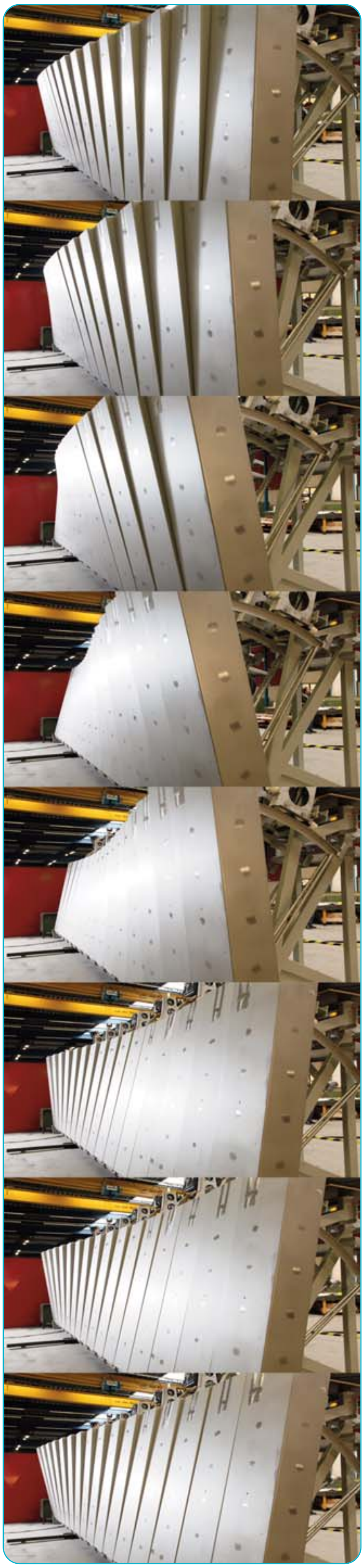
Besides interesting projects for our clients, much research was done and many new research projects have been started. You will find some information on the new projects inside this issue of Newswave.

The progress of the work for our demonstrator of the new side wave generator is well on track. The construction is well underway and the installation of the wave generator segments will start in September. Already in early 2011 this new side wave generator will significantly improve our capabilities in testing ships and offshore structures in very realistic sea conditions.

SMM in Hamburg is approaching in early September and I hope we will have a chance to meet you during this unique event for our industry. The team of HSVA welcomes you to visit us at our booth where we are prepared to answer any question you may have.

Juergen Friesch
Managing Director

HSVA's New Side Wave Generator: Progress of Construction Work



by Peter Soukup and Katja Jacobsen

Increasing requirements on safety and economic aspects during the life of ships and offshore structures demand detailed investigations of the seakeeping behaviour in realistic sea states. For this reason the HSVA decided in 2008 to acquire a new side wave generator for the long side of HSVA's large towing tank. In only few months time it will be possible to generate regular and irregular long- and short-crested, beam and oblique waves as well as cross seas in combination with the existing wave maker.

At the beginning of this year, the construction work of HSVA's new side wave generator has started and a demonstrator of 40m length as illustrated in Figure 1 will be available in January 2011. It is planned to extend the wave maker to the length of 140m after an intensive test phase. One section of the manufactured side wave generator and the stowing system are shown in Figure 2. Altogether five sections of eight metre in length each will be installed in this first construction phase.

Fig.2: One section of 8m length of the wave generator

In order not to disturb other experiments by limiting the tank width with the side wave generator, it will not be installed permanently in the tank. A dedicated stowing system lowers the wave generator in the tank only for the seakeeping tests. During the other tests it will be stored behind the tank wall in a new building extension. The transit from stowage into operation position will take less than one hour. The process is illustrated in Figure 3. Furthermore, wave absorbers consisting of

Fig.1: Impression of the new side wave generator in the large towing tank

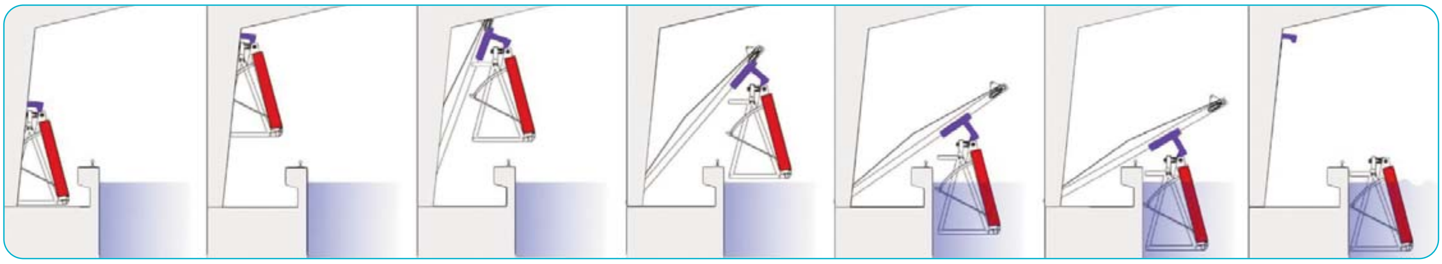


Fig.3: Stowing process of the wave generator

vertically positioned perforated steel plates will be mounted on the opposite side of the tank to dampen the waves.

As the wave generator rests on the tank wall during operation mode an extensive pile foundation has been made to support the tank wall and to carry the dynamical loads in order to prevent the tank wall from swinging. Figures 4 and 5 show the foundation and the base plate of the new building extension. The wave generator itself will be mounted in September 2010, when the civil construction activities are finished.

Already in early 2011 it will be possible not only to carry out seakeeping tests in regular or irregular long crested following or head waves or in transient wave packets, but also tests in beam and oblique waves with forward ship speed and without the need to accept the compromise of zig-zag courses. Even highly realistic scenarios, as in short crested seaways from nearly any direction or even in e.g. wind seas of up to 0.4m significant wave height crossing a swell sea of up to 0.4m in height are possible. By integrating the side wave generator in the middle of the long side of the existing large towing tank the acceleration and deceleration phases of the ship model can be placed in front and behind the actual measuring region. Thus the whole length of the side wave generator can be entirely exploited for the measurements, resulting in a very attractive concept, especially for testing high speed ships in the long basin. Moreover the same large models as for resistance or propulsion tests can be used for the seakeeping tests, thus saving cost and money.

Altogether the new side wave generator will significantly improve HSVA's capabilities in testing ships and offshore structures in very realistic sea conditions.

Fig.4: Impression of the foundation

Fig.5: Impression of the base plate

How to Swim with Sharks – the Project Hai-Tech

by Johannes Schöön

Project partner	Field of work
Fraunhofer Institute for Manufacturing Technology and Applied Materials Research (IFAM)	formulating paint with suitable rheological, mechanical and antifouling properties, as well as developing the paint applicator
Beluga Fleet Management, Nordseewerke	providing a ship for full scale experiments
Fahrion Engineering, Fahrion Produktionssysteme	developing and building the first coating robot
HSVA	figure out where the riblets should be applied, what they should look like, and experimentally confirm their performance

One would not normally think that merchant vessels have anything in common with sharks, but the project Hai-Tech[1] could bring people to make this connection more often. Since the late seventies in the last century, it has been known that microscopic surface riblets, aligned with the flow, can reduce the viscous friction by up to 10%. The outermost scales of shark skin, the dermal denticles, have grooves and ridges that seem to be of suitable size and shape, which has led several scientists to assume that sharks could enjoy this type of drag reduction. If they really do, will remain an assumption until some scientist manages to tame a shark and conduct controlled experiments with it. When applied to man-made objects, however, like aircraft, Olympic rowing shells (Los Angeles 1984), and racing yachts (Americas Cup 1987), there is no doubt that riblets work. Consequently, they have been banned from rowing (1984) and yachting (1987).

If riblets really work that well, then why are they not applied to merchant ships? This is due to practical problems that will arise if the current riblet coating technology, self-adhesive films, would be applied in a marine environment:

- The riblet coating must be (close to) 100% antifouling.
- The service intervals are longer for ships, so small damages must stay small, and not lead to larger coating failures.
- Self-adhesive film is not a workable coating technology for very large surfaces.

If not self-adhesive films present a feasible solution, what are our remaining options? Paint? Yes! Although "riblet paint" sounds as impossible as "checkered paint" (Fig. 1), this is exactly what the Hai-Tech project is all about.

[1]The German word „Hai“ means „shark“ in English

Only through a concerted effort of all project partners (table), the technical hurdles can be overcome.

Due to the practical limitations of the application technology, it was soon realised that the riblets could not be perfectly streamlined. Since the applicator most of all would like to follow straight lines on the surface, i.e. geodesics, HSVA developed a computer code for calculating geodesics on ship hulls (Fig. 2), and comparing their direction to that of true streamlines. With the help of this tool, it was possible to simulate and to assess the losses in drag reduction effect due to riblet misalignment. Fortunately, it turned out that carefully planned geodesics follows the streamlines fairly faithfully most of the time. The drag penalty associated with the misalignment could then be kept within reasonable limits.

The project Hai-Tech is sponsored by the German Federal Ministry of Economics and Technology (BMWi) and will end in 2011.

Fig. 1: Checkered paint in the movie "Santa's Workshop" (©Walt Disney Productions,

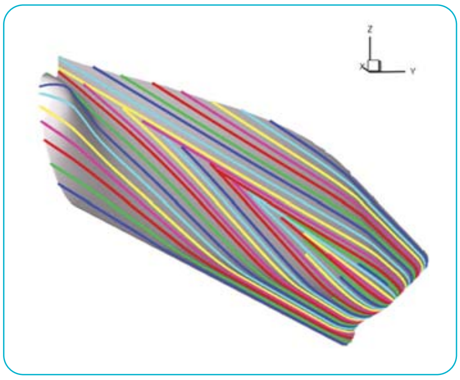


Fig. 2: Longitudinal geodesics on a ship hull

Development of Empiric Prediction Methods for Ice Going Ships Based on Artificial Neural Networks

by Nils Reimer

Today the prediction of resistance and propulsion in ice covered waters is usually carried out by using well established semi empiric methods.

Normally an approach based on certain ship main dimensions as well as hull shape angles and ice properties is used [1]. The total resistance in ice encountered by the ship is split up into components each including different physical phenomena like initial crushing, breaking, as well as submersion and sliding of ice floes along the hull.

The prediction of resistance and power in a broken channel is based on calculations according to the rules of the Finnish-Swedish Administration. Likewise the approach for level ice these formulas include certain hull form and ice parameter. Another similarity to the above mentioned method in level ice is the superposition of single components to determine the total resistance [2].

The disadvantage of these procedures is that interactions of simultaneous effects are hardly taken into account. Results of model tests and full scale trials on the other hand show high correlation between single parameter influences like for instance the dependence of total resistance to ice thickness and ship speed. Another aspect is the validity of the existing methods, which are based on a certain range of ships of comparison. Since the time when these methods were established, the ice breaking hull shape of ships has been further developed and the number of ships with a conventional hull form operating in ice covered waters has increased.

To offer a prediction including both, a preferable realistic parameter basis and a larger range of validity concerning hull shape and main dimensions, a prediction method based on artificial neural networks (ANN) was developed in scope of a master thesis at HSVA [3]. Neural networks offer the possibility of learning multiple relations of a physical problem without requesting an explicit approach. Assumptions about superposition or interaction of single components or effects are therefore unnecessary. The networks are trained on a certain parameter set including both, input and target quantities (resistance, requested delivered power). The training itself is performed with gradient descent methods (see Figure 1).

If the training set includes enough information, in a second step, the network is able to generalize the dependencies to predict the target values by using an unknown input data set.

To avoid memorization of presented data during the learning phase, the network has to be validated continuously by using unknown data sets. The optimum training stage is reached, if both training and validation error have reached their minimum (see Figure 2).

To enable the networks to learn the relevant parameter relations, data collected during model tests at HSVA were used. The input vector included main ship dimensions, hull shape and ice parameters. The results produced, showed acceptable accuracy and plausible dependencies.

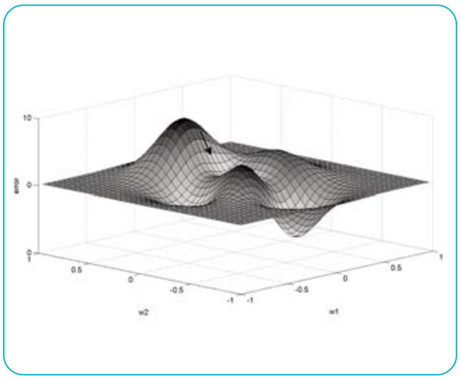


Fig. 1: Gradient descent method

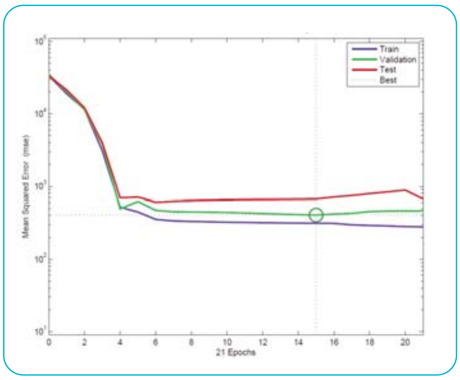


Fig. 2: Error for training and validation

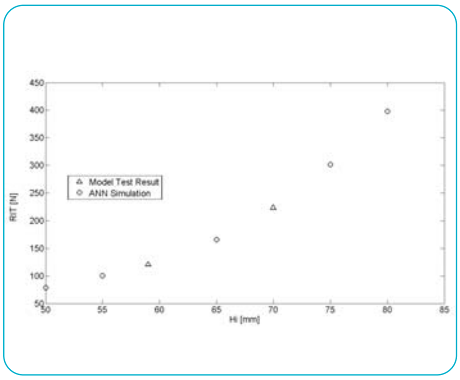


Fig. 3: Results of model tests and ANN

Bibliography:
[1] Lindqvist, G.: *A straight forward method for calculation of ice resistance of ships*, In POAC, June 1989
[2] Riska, Kaj: *Performance of merchant vessels in ice in the Baltic*, Helsinki University of Technology, December 1997
[3] Reimer, Nils: *Development of empiric prediction methods for ice going ships*, Hamburg University of Technology, May 2010

HYDROFERT – Investigating the Influence of Surface Imperfections

Fig.1: Production related imperfections: welding seams (left) and plate buckling (right)

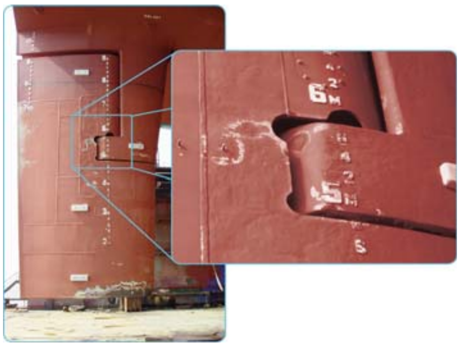


Fig.2: Semi-spade rudder with erosion damages in the pintle area

✎ *by Uwe Hollenbach and Frank Lumpitzsch*

The quality of ship hull surfaces and its influence on the hydrodynamic performance, mainly ship resistance, has been questioned since long. While manufacturers have spent significant effort on improving production quality over the years, this was mainly to achieve higher accuracy and minimise rework. The effects that weld seams, shell buckling or other production related surface imperfections have on hydrodynamics and ship resistance in particular have hardly been investigated.

HSVA, together with their partner IMAWIS, addressed the topics in the HYDROFERT project funded by the German Federal Ministry of Economics and Technology (BMWi). In a range of high Reynolds number experiments carried out in HSVA's large cavitation tunnel HYKAT and numerical investigations, different types of surface imperfections have been investigated to determine their effects on hydrodynamics. Studies of the boundary layer as well as cavitation inception have been performed.

The HYDROFERT project investigated three separate, but related hydrodynamic topics. The first topic involved turbulence modelling and forces on plates. The second topic focussed on cavitation inception on rudders, and the final topic involved the effects of surface imperfections on model test and computational results for a

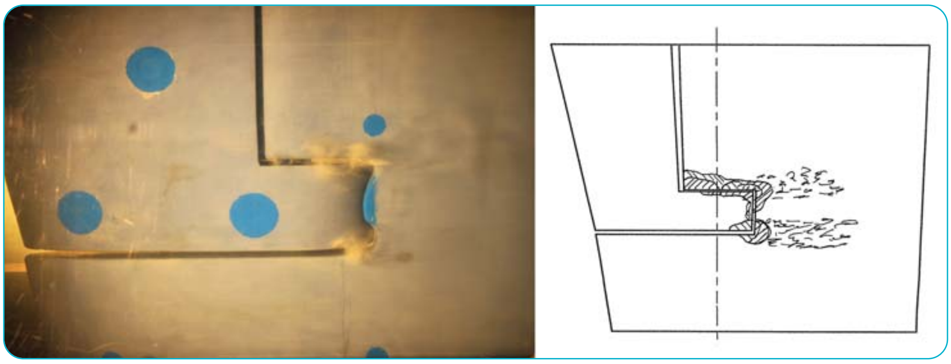


Fig.4: Cavitation on actual measured rudder geometry

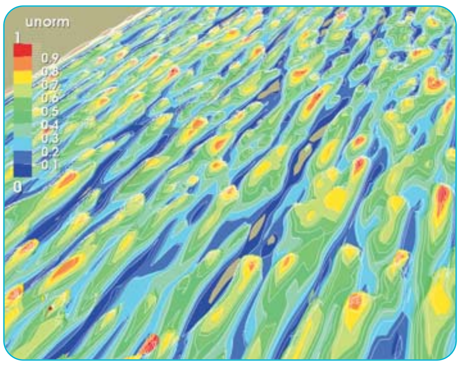


Fig.3: Turbulent structures in the boundary layer using LES

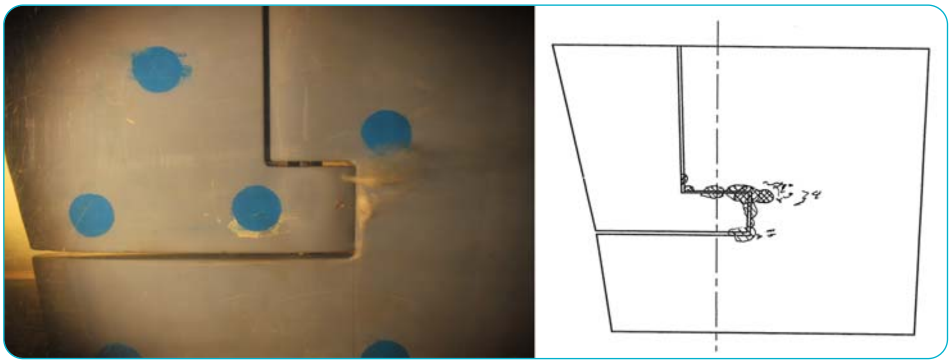


Fig.5: Cavitation on ideal rudder geometry

torpedo-shaped test body.

Fundamental study on plates

The fundamental study on plates show an important result: both in measurements and in simulations it is nearly impossible to get reliable results for body forces and detailed boundary layer profiles at the same time. The simulation requires transient calculations for the boundary layer and the laminar / turbulent transition on one hand, and steady state calculations for the forces on the other hand, but this requires different numerical models. The same applies to the model testing: during measurements the use of PIV (Particle Image Velocimetry) does not allow force measurements with the three-component balance in our facilities and vice versa.

The transition process and the turbulence predicted by LES (Large Eddy Simulation) are represented astonishingly accurate, however, a RANS-simulation (Reynolds Averaged Navier-Stokes) is more suitable for determining the forces. Measured and simulated velocity profiles show good agreement for all cases. Generally the predicted forces by LES seem to be of the same character as those predicted by RANS.

Investigating the rudder models

The investigation of the model rudders in HYKAT used two geometries: an idealized semi-balanced rudder as reference and an actual rudder geometry provided by IMAWIS. The rudders were fitted behind a typical large container ship.

The cavitation observation concentrated on the most critical region, the gap between rudder horn and rudder. Here, cavitation inception began at small rudder angles and increased rapidly with larger rudder angles. For the actual rudder geometry (including castings, plate buckling and welding seams provided by IMAWIS) the cavitation was much more pronounced, compared to the ideal rudder geometry.

Based on this result, for cavitation testing it is much more beneficial to use the actual detailed rudder geometry instead of an ideal rudder geometry when judging full scale erosion damages.

Investigating the effects of buckling and welding seams

To investigate the effects of buckling and welding seams a torpedo-shaped test body was used in HYKAT as a basis for different surface structures. The torpedo body consists of a tube from a diameter of 0.5m and a length of 6m in total. The welding seams are designed from plastic ribbons attached every meter, nearly matching actual welding seams provided by IMAWIS. Consequently each tube had six buckle arrays, each with three buckles in a nearly realistic dimension of real-ship array size. The buckles were generic from first-order plate theory with fixed mounting all around and subsequently transformed to cylinder coordinates.

Four cases were investigated both in model tests and in numerical calculations: flat surface, flat surface with welding seams, buckled surface without and buckled surface with welding seam.

For the numerical simulations the in-house code ***FreSCo⁺*** has been used.

The measurements indicate that the plate buckles and the welding seams contribute to the same amount to the resistance increase compared to the ideal test body with flat surface. Model test results and numerical calculations were found in good agreement and these will now be used to develop a method for estimating the full scale added resistance caused by plate buckling and welding seams.

Fig.6: Test Body seen from aft

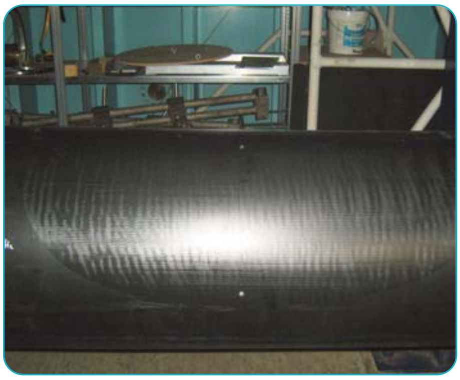


Fig.7: Buckle on Test Body

Fig.8: Generic Welding Seam on Test Body

Upcoming R&D Project DYPIC (Dynamic Positioning in Ice Covered Waters)

Fig.1: Supply vessel "Vidar Viking" with attached drilling rig in ice

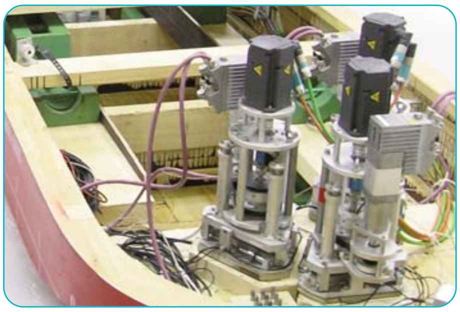


Fig.2: Engines of azimuth thrusters installed in a model

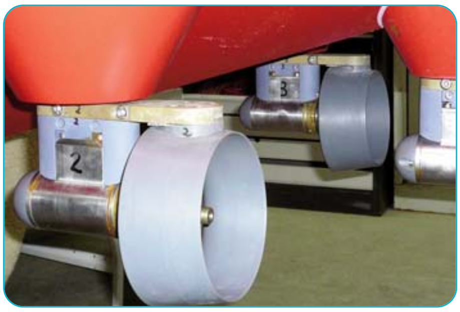


Fig.3: Model azimuth thruster

by Andrea Haase

DYPIC is a research and development project within the EU's ERA-NET MARTEC project. Financially it is supported by the BMWi. The duration is 2.5 years, from August 2010 to December 2012. Qualified international partners from France (Sirehna) and Norway (NTNU, Kongsberg Maritime AS, DNV and Statoil) join HSVA in this challenging project.

Dynamic positioning

The intensified exploration of oil and gas in arctic regions, including deep waters - where mooring is costly or impractical - increases the demand of station keeping under ice drift conditions of arctic drill-ships, icebreakers and offshore supply vessels. Dynamic positioning for exploration operations in open waters is well known and a lot of experience has been gained during the last decades. In ice this is not the case.

HSVA's state of the art

At present no DP system for ice model testing is available to investigate the station keeping behaviour of ice going vessels. Physical model tests, such as oblique tests, are used to determine the necessary input parameters for full scale DP systems. Also tests with manual station keeping have been performed. For those tests HSVA has 4 azimuth propulsion systems of same size which are able to determine system thrust, propeller revolution and shaft torque. However, for DP tests with drilling vessels in ice at least 6 of these thruster types are needed.

HSVA's upgrading within DYPIC

Currently HSVA offers the possibility for a DP system provider to connect via an analogue interface box to HSVA's model propulsion system controller and steer the model. Soon HSVA's propulsion system stock will be completed by two additional thruster packages. As the DYPIC project proceeds HSVA will be equipped with a complete model DP system by which the model position and heading will be controlled. All involved data will be transferred completely without cables.

Prospects of a Model DP system

Once the DYPIC project will have been successfully completed HSVA will be the only model test facility to perform such station keeping tests in ice worldwide. Dynamic positioning in ice model testing allows to systematically investigate the boundaries of certain operations in different ice conditions. At HSVA clients then have the chance for feasibility studies of their planned operations.

Fig.4: Ice model test – in future possible without cable connection and using a DP system

CFD helps to optimise Fjord1 Ferry Services

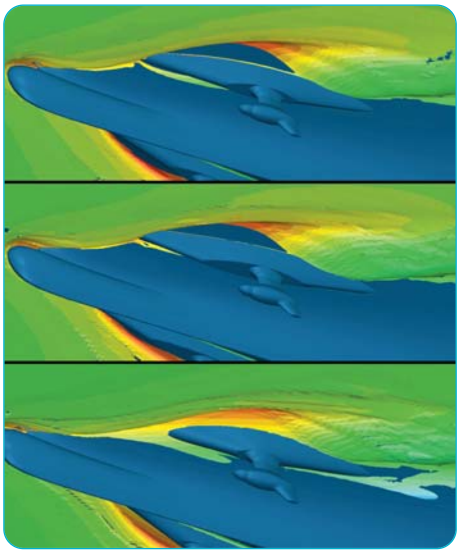
by Scott Gatchell and Jochen Marzi

Fjord 1, one of Norway's leading coastal ferry operators run a vast amount of ferry services inland Norway and along the coast as part of the Norwegian Coastal Highway. Being part of a highly sophisticated transport system, they require high performance and reliability of their operation and especially their vessels. Most of the ships are designed as double ended vessels offering high flexibility during loading / unloading and hence unrivalled performance during port time. Optimising the design of a double ended ferry for a range of sailing conditions however imposes great challenges on the hydrodynamics of the vessel. Fjord I have entrusted Multi Maritime A.S. to design their newest member of the fleet. The design of the new ship features a symmetrical bow / stern configuration with bulbous "bow". A propulsion concept based on 4 Rolls-Royce Azimuth thrusters mounted in head boxes has been adopted for the project. The four propulsion units form a prominent part of the underwater hull and proper alignment of the headboxes is of prime importance for the performance of the ship. HSVA has been commissioned to optimise the shape of the headboxes in a numerical exercise and perform model tests to find the optimal angle of attack of the Azimuth thrusters as well as to confirm the numerical results. The optimisation targeted a high speed condition at scantling draft.

Starting from a given design provided by the client, HSVA used ***FreSCo⁺*** to analyse the flow over the complete appended hull including thrusters and headboxes in a VoF based free surface prediction. This lead to a detailed insight into flow effects such as local directions and wave elevations which were then used to design different alternative shapes of the head boxes. The challenge of this exercise is to design the headboxes so that minimum resistance and maximum propulsive efficiency can be obtained for operation in both directions. Determining the appropriate entrance and exit angles of the headbox and limiting the flow acceleration in the canal between the main hull and the inner side of the headboxes proved vital. The figure to the left indicates the complex flow situation around the headboxes at the bow for different designs. In several iterative steps a geometry following the main flow direction introduced by the ship hull has been derived. This included an initial analysis of a set of geometry variations with our in-house panel code nu-Shallo. Following that, complete RANS VoF predictions for the hull-form including complex appendages have been performed with ***FreSCo⁺***. Figure I compares wave elevations along the hull of three selected design alternatives.

A careful adaptation of the geometry of the headboxes lead to a reduction of 5.3% in the predicted effective power for the final version.

Model tests were performed in HSVA's large towing tank with a fully appended scale model of the ferry. These confirmed the ***FreSCo⁺*** overall force predictions as well as flow details such as limiting streamlines shown in Figure 2. During model tests also the optimum angle of attack for the thruster units was determined.



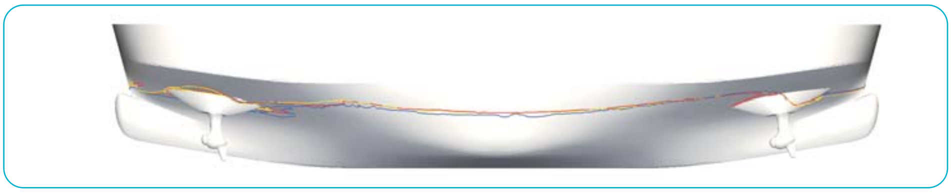


Fig. I: Comparison of Wave profiles along the hull for 3 designs, (z-direction amplified)

Fig. 2: Comparison of wall streamlines obtained from model test and CFD prediction

CFD Prepares the Ground for Safer Navigation

by Grete Ernst

The increasing traffic density on world wide shipping routes demands new navigation assistance systems in which all vessels share information to become part of a collaborative navigation network. Facing this challenge, the EU funded ARIADNA project – coordinated by ISDEFE from Spain – has been launched in November 2009.

ARIADNA
The Maritime Volumetric Navigation System

ARIADNA aims to design a new navigation assistance tool that, in contrast to today's systems, which only show point positions, visualises the vessel's actual size plus a so called safety envelope. Just as Ariadna's thread helps Theseus to find his way out of the labyrinth of Minotaur in the ancient Greek legend, the ARIADNA navigation assistance tool shall facilitate navigation in areas of high traffic density.

The idea of volumetric navigation systems arises from the aeronautic sector and is expected to increase efficiency and safety in confined waterways, harbours and inland waterways. The safety envelope enclosing each vessel is defined by various parameters such as ship speed and manoeuvrability, but also environmental factors such as water level, current and wind speed.
Each vessel will generate its own safety envelope and distribute it via existing data transfer systems like the Automatic Identification System (AIS) to other vessels in its proximity. Visualising all vessels safety envelopes can provide warning and manoeuvring support for collision avoidance, and provide risk and warning assessment to vessel and navigation control systems.

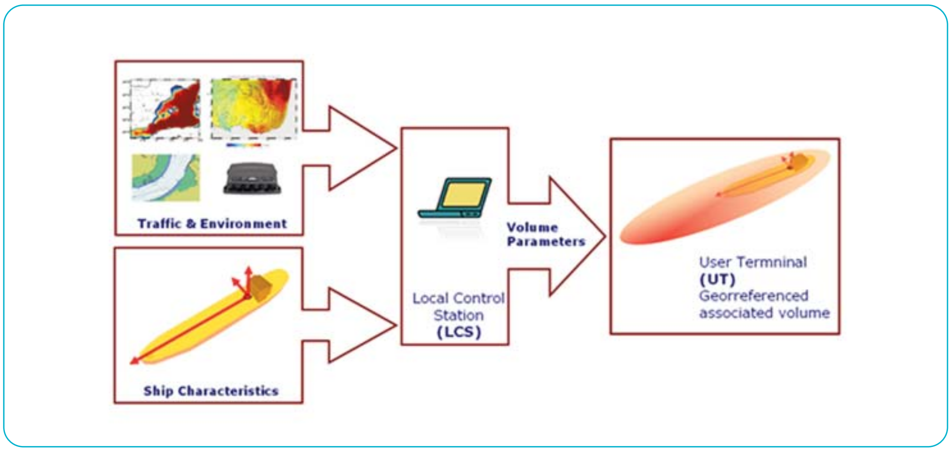


Fig. 1: Concept of generating the safety envelope

As interaction of ships is also a safety aspect in confined waterway navigation, HSVA undertakes the task of producing on-demand predictions of ship generated waves for each vessel, which will influence the expansion of the safety envelope beside and behind the ship.

HSVA's in house potential flow code nu-Shallo has been proven to be a reliable tool for predicting ship waves over the last ten years. As the time factor – ARIADNA envisages update intervals of less than five minutes – is a new challenge in this context and forbids running complete potential flow calculations every time, especially when sailing in shallow water, HSVA started to introduce Artificial Neural Networks (ANNs) for the prediction of wave patterns. ANNs have already been proven to be powerful tools in various engineering fields. A well trained ANN can substitute a database with a dramatically smaller need for memory.

For ARIADNA a training data set is generated for each vessel with nu-Shallo defining the outer most coordinates of waves with critical heights for different ship speed, trim and water depth. The aim is to define a box around the ship outside of which no critical wave heights have to be expected.

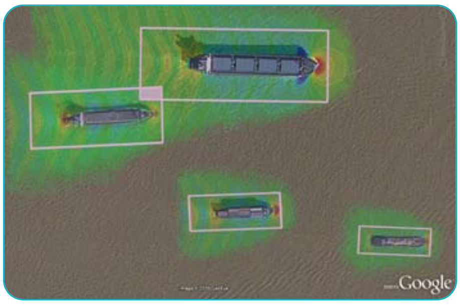


Fig. 2: Ships with predicted wave pattern and boxes, enclosing areas of critical wave

A well trained ANN is capable of delivering the dimensions of this box for every sailing condition in a split second. This information can then be included in the parameter set for generating the safety envelope mentioned above.

The ARIADNA project will continue until August 2012. First field tests of the system are scheduled for summer 2011 and will take place on the Danube in Austria.

The ARIADNA project will disseminate its findings via a public web site at: www.ariadna-fp7.eu

The Hamburg Ship Model Basin TARGETS energy efficiency of ships

by Jochen Marzi

Energy efficiency and environmental considerations both are among today's driving forces determining maritime operation. Economical pressure and international legislation require a sensitive use of energy resources and a reduction as well as a proper treatment of associated emissions. To address ship energy efficiency in a holistic way, HSVA, together with a group of twelve leading EU maritime research organisations and shipping operators, has initiated a new EU project:

The TARGETS – Targeted Advanced Research for Global Efficiency of Transportation Shipping – project was submitted to the 3rd Call of the Surface Transport Programme and will launch shortly after negotiations have been finalised. TARGETS aims to provide substantial improvements to ship energy efficiency by adopting a holistic approach to energy generation, transmission, consumption and operational management with focus on life-cycle issues. Use is made of all contemporary developments at scientific and practical levels to enable technologies, tools and strategies that could facilitate step changes in energy generation / utilisation onboard ships. For maximum benefit concerning impact on energy efficiency and the environment (energy efficiency and environmental sustainability are inextricably linked) ocean-going cargo ships are singled out, such ships undoubtedly being the largest consumers of energy as these ships constitute the backbone of maritime transport (hence the effect from any improvements of energy efficiency will be large scale).

Hydrodynamic aspects play an important role in energy consumption of cargo vessels. The following Figure 1 indicates that almost 80% of all practically available energy generated aboard an ocean going cargo ship is applied to overcoming hydrodynamic forces (and losses). This offers a vast potential for improvements, especially of ship resistance and propulsive efficiency.

Adopting a systematic methodology that integrates component-based knowledge of resistance and propulsion at system-based level (shipboard systems / plant configuration) and the development of a suitable simulation tool for the prediction, evaluation and management of energy performance in ship design and operation for varying operational profiles is a key aim of TARGETS. Whilst emphasis will be placed on improving understanding of the hydrodynamic aspects of energy consumption, advanced or unconventional energy generation and management concepts will also be considered. Comprehensive analyses of different operational profiles will reveal key design and operational parameters for optimum energy consumption during a ship's life cycle.

Assembling leading European fluid dynamics and energy specialists and major EU shipping operators covering a broad range of cargo transport operations (containers, bulkers and tankers), the TARGETS project will deliver a systematic methodology for a holistic energy performance evaluation and prediction and a robust simulation tool, capable of facilitating life-cycle optimum energy consumption, coupled with all requisite design information at ship and systems levels, tools and operational guidelines; hence make a significant contribution to the cost effectiveness of shipboard transportation but much more significantly to the reduction of greenhouse gas emissions.

The TARGETS project will disseminate its findings via a public web site at www.targets-project.eu

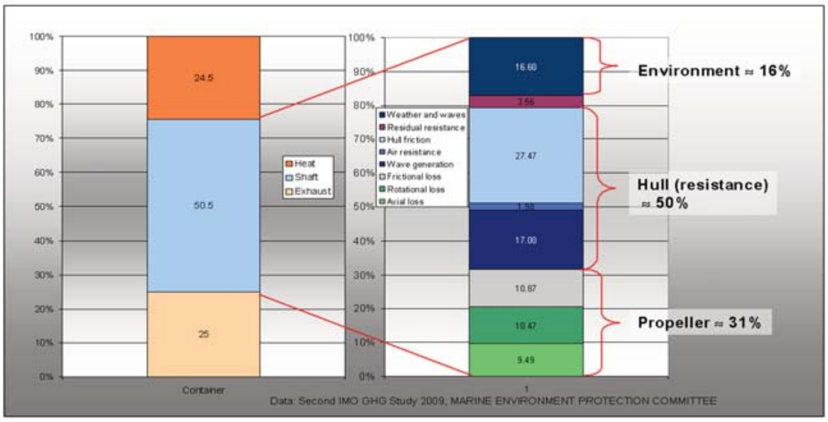


Fig. 1: Details of ship energy consumption

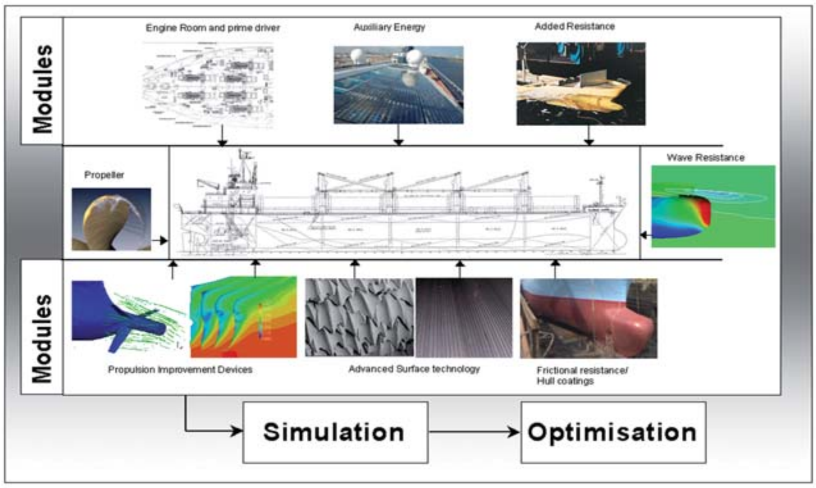


Fig. 2: TARGETS system approach to energy performance evaluation, simulation and optimisa-

Member of staff

Dr. Katja Jacobsen joined HSVA in October 2008 as project manager in the seakeeping and manoeuvring department. In particular she accompanies and coordinates the activities which are related to the new Side Wave Generator during design phase, manufacturing and installation process as well as the start-up of operation. Besides she is also responsible for the performance of seakeeping tests. Her main interest lies in the realisation of tailored model tests for the offshore industry. She is also in charge for the tests within the research project GOALDS.

Katja Jacobsen obtained her diploma in Naval Architecture and Offshore Engineering at the Technical University of Berlin with distinction in 1998. After that she started to work as research engineer at the Offshore Engineering Department of TU Berlin. She was involved in research projects investigating the seakeeping behaviour of offshore structures in waves and in extreme seas, in the development of a maritime pipe loading system, installation of wind energy plants and the development of the German Educational Network in naval architecture and ocean engineering. Already during her studies she was strongly interested in wave-structure interactions with special emphasis on the analysis of the hydrodynamic coupling of multi-body systems in waves. In 2005 she obtained her doctoral degree and was awarded the Curt-Bartsch-Price.

As a counterpoint to her job she likes to play the trombone with particular interest in classical music but also with loops to popular music.

New Project 'PREFUL' on Propeller Performance Scaling just started at HSVA

by Heinrich Streckwall

R&D in the maritime sector will usually find founding on a national basis or in the EU-framework. For project-proposals that are addressing especially the real-time industrial application of research activities the MARTEC-network provides alternative resources. MARTEC-proposals are evaluated on an European scale but financed by national Ministries or institutions.

HSVA, MMG on the German side and CTO and SCANA on the Polish side suggested a combined investigation of the propeller performance scaling problem. The relevance of an appropriate scaling procedure is evident from the fact, that usually model scale tests serve to decide on propulsion concepts and to select between alternative propeller designs. In this context the evaluation of propeller open water tests plays a key-role, since it includes the estimation of the full scale propeller efficiency.

When the German/Polish suggestion – acronym 'PREFUL' - returned from the MARTEC-evaluators the significance of a 'watertight' propeller scaling procedure applicable to any type of modern propellers was documented by the high ranking 'PREFUL' achieved. The 'PREFUL' -project on propeller scaling started recently (1 July 2010). In the experimental part of 'PREFUL' a conventional, a high skew, a tip raked, a ducted and a podded propeller will be tested in the cavitation tunnels of HSVA and CTO to obtain the highest possible Reynolds-Numbers. In the numerical part these propellers will be analyzed for model scale and full scale dimensions. The essence of the accumulated results will be used to update the standard propeller scaling procedures. The project will run for 2 years. To disclose the results for the benefit of the European shipbuilding community a workshop will be held at the end of the project (i.e. in summer 2012).

SMM 2010 Congress Center Hamburg

From September 7th-10th the Shipbuilding, Machinery & Marine technology international trade fair (SMM), the most important maritime exhibition in Europe, takes place at the Hamburg Congress Centre.

HSVA is looking forward to seeing you at our booth No. 260 in hall B4, to present our actual research projects as well as recent developments.