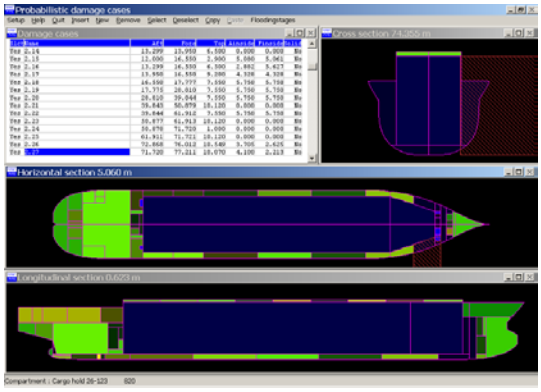
Graduation subject:
Inventory and implementation ship's stability regulations

November 2008

Definition of the problem



The stability that is minimally required to guarantee the safety of a ship, the persons on board and the environment has been laid down in legislation. This legislation is rather fragmented, which means that different rules apply to various types of ships (such as dry-cargo ships, tankers, high-speed craft, passenger ships, yachts and dredgers) and sailing areas (such as unlimited maritime navigation, coastal navigation, large inland waterways and rivers). Apart from that, the rules have evolved in the course of time and countries or regions may also have their own requirements or interpretations.

The computer program PIAS (an ancronym for *Program for the Integral Approach of the Ship design*), which is frequently used in the Netherlands, is suitable for testing the ship's stability against all, that is, against *almost* all these requirements. The manual of PIAS indicates how the most frequent requirements can be selected, but what is lacking is a clear and coherent overview of the characteristics, connection and differences of the various requirements. Although such background information not *necessarily* needs to be supplied with a computer program, the users and ship designers could very well take advantage from it.

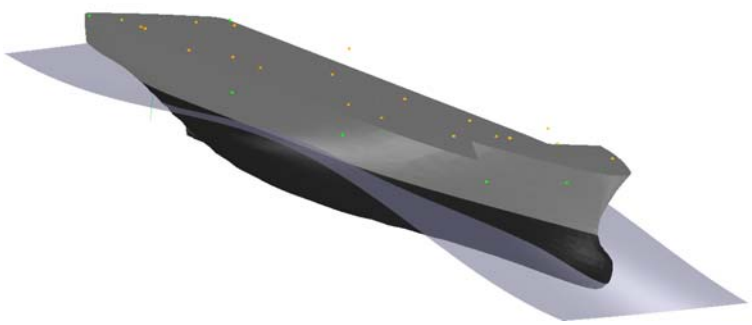
Graduation subject

Graduation includes an inventory of the current and previous stability criteria and making an analysis of their backgrounds, domain and further specific features. Subsequently is investigated how and to what extent these criteria can be set in PIAS and exemplary calculations and verification calculations are performed with PIAS. Finally, a handy book is composed which can be supplied to the users of PIAS and other interested persons.

Activities

- Entering into the (damage) stability matter and in PIAS.
- Literature study and internet study into stability criteria.
- Categorization of those criteria and drawing up a taxonomy thereof.
- Critical analysis of the result, as well as drawing up of recommendations, regarding the criteria as such, as well as regarding its processing in PIAS. Making a book with an overview of the criteria and the manner in which these can be calculated with PIAS.
- Report including conclusions and recommendations.

			Criterion	Value
Draft summer (usk)			8.117	6.984 m
T aftmark (usk)	=	9.749 m		
T Foremark (usk)	=	4.246 m		
Trim	=	-5.548 m		
Statical angle of inclination is	=	-6.32 degrees		
Roll period	=	14.75 sec		
Restarm	@ BF1% , H=8.8m	(>)	0.100	1.298 meter
Statische hellingshoek	@ BF10 , H=8.8m	(<)	15.000	1.960 degrees
Statische hellingshoek t.g.v. draaicirkel varen		(<)	15.000	14.711 degrees
Restarm op golftop	@ H=8.8m	(>)	0.050	1.161 meter
Restbereik op golftop	@ H=8.8m	(>)	10.000	45.000 degrees
Loading condition complies with the stated criteria.				

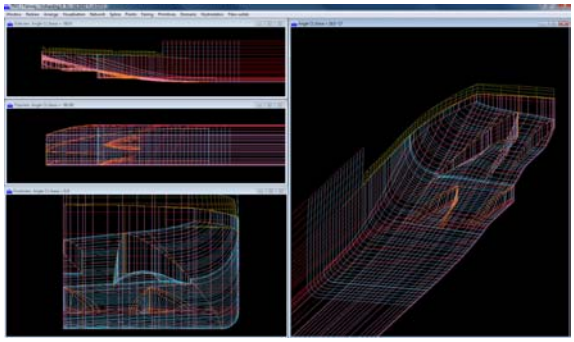


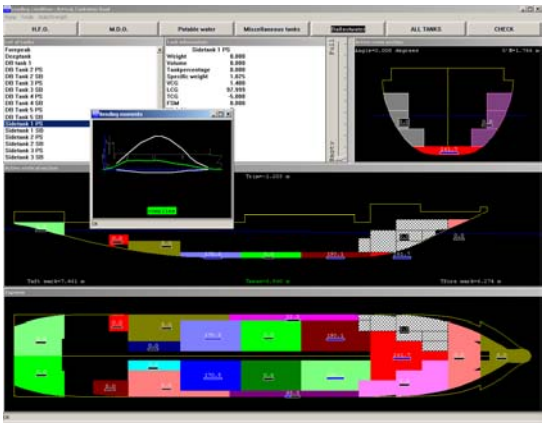
Graduation level

This subject is aimed at bachelor graduation level, with a time span of three or four months. However, in dialogue with candidate and/or educational institute a different level or time span can be discussed.

SARC

SARC BV, located in Bussum[1], is a small, innovative company, founded in 1980. Its focus lies in the field of naval architecture and marine engineering and involves ship design, specialized ship design calculations, consultancy and the development of software for use in these areas. This software is bundled in packages *PIAS, Fairway* and *LOCOPIAS,* which have become standard in the Dutch maritime industry. There is a continuous software development effort, with the emphasis on the application of theoretic or first-principle methods.





For more information, you can contact:

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[1] Bussum is situated about 25 km south-east of Amsterdam.