**Project Aim**
The main aim of the project is to improve the safety of modern sailing yachts by developing an understanding of the re-righting tendencies through physical and theoretical modelling with "real world" correlation.

Through using the models developed the effects of hull form and stability parameters will then be investigated, resulting in scientifically deduced measures of sailing yacht safety.

---

**Sailors' Forum, Self-Righting - Important Design Features and Proposed Regulations**

**Forum Purpose**
The purpose was to:
- Introduce current research techniques
- Get ideas/suggestions from the wider sailing community

---

October 2000

This research program has been under-way at the Australian Maritime College in Launceston for nearly two years now. The work within the project has built on the past experiences of the College from capsizing work and now includes study for a PhD student.

As a part of this project two Forums were held on 2nd and 3rd October 2000 at the Royal Melbourne Yacht Squadron and the Royal Sydney Yacht Squadron.

Over 40 people attended the Forums including designers, builders, sailors, researchers and representatives from safety authorities and regulatory organisations. The program of the Forums was:
- Introduction to the science of self-righting,
- Brief overview of existing work and results,
- Current and future stability standards as applied to the Australian fleet,
- General forum discussion.

A large amount of audience participation in the discussion lead the Forums into extremely informative digressions.

One of the key issues to be raised at both venues was how a capsized yacht will be flooded. It is known from hydrostatic analysis that a flooded yacht, whether inverted or upright, will be less stable once flooded. Also sailing yachts are generally far from sealed when inverted, indeed it is not unusual to expect a few tonnes of water to come on board when a yacht is inverted. From a design point of view, it is feasible that controlled flooding could help in bringing a yacht upright. However, the dangers involved with...
intentionally flooding a yacht are obvious and large safety margins would have to be included. The experiments so far have included some tests on the effect of flooding, as a result of these forums it would appear much more work needs to be done in this area.

This also leads on to another important point, that of changing the trim of the inverted yacht. Trimming by the bow can have a dramatic effect on reducing the stability, in either upright or inverted positions. This can be achieved by either flooding the bow, or perhaps a preferable option would be to add buoyancy to the stern of the yacht in the inverted position. It was pointed out by one of the attendees that such a system exists for some “rubber-duck” style craft. However, the dangers were also pointed out in that the companion-way could be exposed to the free surface thus allowing even more water into the yacht, and opening up the possibility of actually sinking the yacht.

It was possible to detail a few anomalies exposed by the research, and these were discussed at length within the Forums. For example, a case where increasing the limit of positive stability has actually lead to an increased inversion time has been identified. Some ideas were suggested for this such as the “tripping” effects of profile areas and perhaps even free surface effects from trapped air bubbles.

The 1998 Sydney to Hobart yacht race fleet was used to show the effects of numerous stability standards, exposing a few possible strengths and weaknesses if the standards were applied directly to this fleet. Screening formulae for regulations in the past have focused mainly on capsize resistance, the work of screening sailing yachts for their inverted performance has only just begun.

For further information on this project please contact:
Jonathan Binns
Research Student
Australian Maritime College
PO Box 986
Launceston TAS 7250
Phone: 03 6335 4891
Fax: 03 6335 4720
Email: J.Binns@mte.amc.edu.au
Web: http://www.geocities.com/sailrerighting

Acknowledgements - assistance for this project has been received from many sources, including:

- Murray, Burns and Dovell
- Formation Design Systems
- Australian Research Council
- Ocean Racing Club of Victoria
- Australian Yachting Federation
- RMYS, RSYS, RPAYC
- RINA
- Mr David Lyons
- ABC News, Ian Grant

23/10/00

Background picture by ABC News