AMC Project Advertisement

Project Title:

Better understanding of dynamic stability through ship's motion responses

Project Description/Summary/Objectives:

Exploring the operational links between a sea state and a ship's heading and speed provides the opportunity to continuously monitor dynamic stability behaviour; and hence to avoid significant changes of stability in adverse weather. Significant changes of stability at sea can lead to dangerous transient situations and eventually stability failure. Despite its importance, the current intact stability (IS) criteria do not evaluate or consider the dynamics of the motion responses of a vessel in a wave.

The measurement of waves whilst a ship is underway is a major challenge, whereas ship motion, which is relatively easily measured, is a good indirect reflection of the encountered wave characteristics and which can be measured, stored and analysed using on-board equipment.

In a recent study, numerical model and physical model were simulated and tested at different speeds, sea conditions and angles of wave encountered. The investigation was limited to the effects of encountered frequency components and the associated magnitude of energy of the ship's motion responses.

The next step of this project intends to extend the research, which would be a stepping stone towards development of a real-time decision support tool in order to improve the dynamic stability of ships by controlling the extreme roll motion.

To improve ship safety, a better understanding of different ship hull responses in extreme conditions need to be developed. More broadly, research is also needed to consider the effect of length, displacement and loading conditions and other dynamic factors, such as the effects of transient green seas and spray, high winds particularly on the beam of the ship, and the movement of liquids in slack tanks with the two different effects of slushing and free surface effects.

More information:

Please contact **Hossein Enshaei** for more information on the Project

Please contact Research.North@utas.edu.au for information on application procedures