

# Intern Student Proposal

Development of a Solid Modelling/Finite Element Model of a Type 23 Frigate

Supervisors: Dr. Mike Gibson and Dr. Alex Mota

## Abstract

To enable an analysis to be conducted of a detonation in a harbour, a mixed kinematic-specification model was created using Autodyn, a well-known commercial hydrocode. To complete the simulation, a model of a Type 23 is required.

## Pre-requisites

- A numerate background, preferably a degree incorporating at least some aspects of mechanical engineering
- Experience with 3-D CAD tools
- Experience of stress analysis
- Knowledge of FEA/hydrocodes
- Matlab skills would be beneficial

## Problem details

A model of a harbour scenario has been created which features the harbour side, various land based features such as a crane, as well as a section of the sea and sky. To complete the model of the harbour, a model of a ship is required.

The creation of a ship model is non-trivial due to its irregular shape, as well as the complexity of its internal structure. As with any modelling exercise, during the first portion of this project the student will research the candidate vessel and gather data about its structure. A plan of how it should be best modelled, including such issues as which features are most relevant and which could be omitted, and where mesh refinement is most needed.

Once this process has been documented, the student will proceed with creating a *solid model* of the ship and then begin initial meshing. This will allow the student to determine the element budgets for various sections of the ship.

Once a suitable mesh has been applied to the solid model, it will be added to the existing harbour model; the combined system will be used to conduct a number of blast loading simulations in conjunction with the project supervisor.

A written report detailing the work undertaken and subsequent findings will then be prepared by the student.