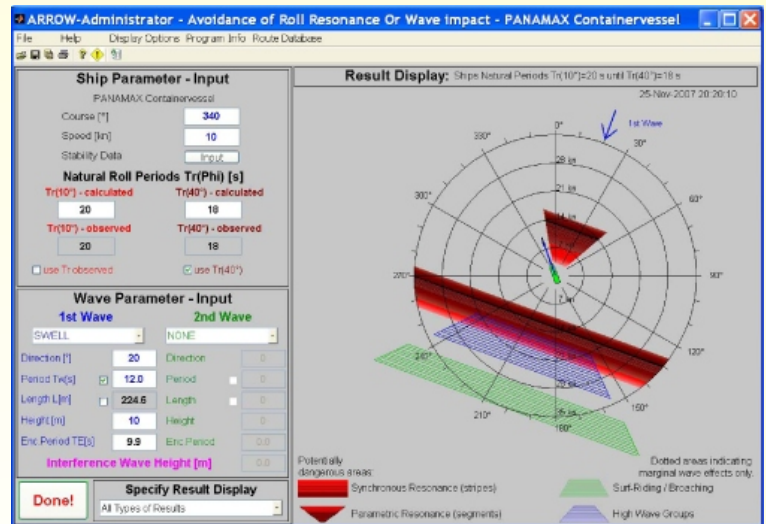
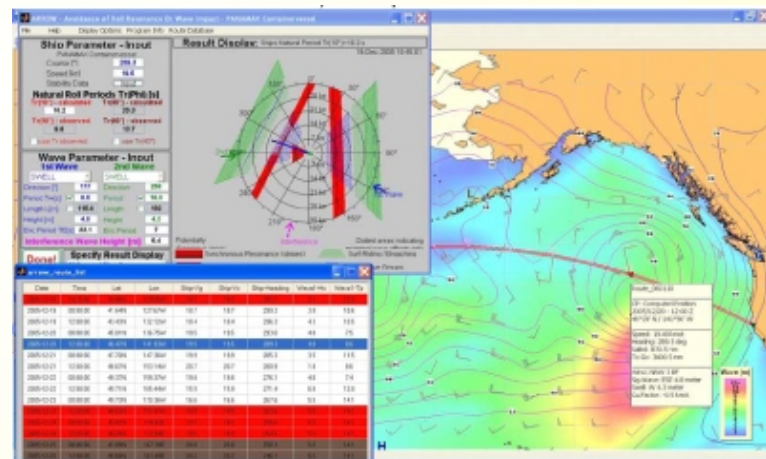


ARROW - Software for Avoidance of Roll Resonance Or Wave Impact

The ARROW program is a software tool to estimate and display the potential conditions and countermeasures to Avoid Rolling Resonances Or Wave impacts on ships due to specific wave encounter situations. By means of the Main user interfaces (Fig. 1) the input of a small amount of data are needed to be entered into the areas of the Ship Parameter Input (top left side) and Wave Parameter Input (lower left side) to provide the results in the Result Display Area (right hand side):



When using the onboard weather routing system "Bon Voyage" from Applied Weather Technology AWT the most recently edited route can be imported (top menu: "Route Database/ Load Route Database") and viewed in the ARROW route list table. ARROW will instantly analyse the route points of this route in terms of the formerly described risks with respect to the different types of resonance and wave impacts. If any line has been highlighted red then there is a potential risk, if orange then a marginal risk may have been left.



By simply clicking on the corresponding line in the ARROW route list table (see Fig. 6: left corner bottom; blue line) the status of a route point can be viewed in both the Result Display and Wave Parameter-Input section (top left). In this case even two wave systems were existing (swell from 117° and from 268°). In order to avoid potential resonance conditions either the route can be changed in the Bon Voyage system (course or speed respectively) or the ships natural rolling period could be adjusted (to be checked by GM corrections in the ARROW interface). Both options can be used to find suitable conditions by simple trial and error methods in the phase of voyage planning or for the actual condition at sea. Due to any changes in the route or weather conditions in the Bon Voyage system the new data will be transferred automatically to ARROW and an updated ARROW route List will be displayed. This immediate update will also take place, if the stability data respectively the roll period are being changed.