Project 2: Intact Stability Analysis

Date issued: October 13, 2004
Date due: October 27, 2004

1. Intact Stability
An intact stability analysis follows naturally from the hydrostatic analysis performed in Project 1. While hydrostatics can predict initial stability through the placement of KM, the goal of the intact stability analysis is to ensure an adequate range and margin of stability.

There are various techniques to finding the righting arm, or GZ, of the inclined hull form. For this assignment you are welcome to use any computer aided or manual method you prefer, but it is strongly recommended that you use the Program of Ship Salvage Engineering (POSSE).

2. Assignment
2.1 Produce hydrostatic tables for USS OLYMPIA at every half-foot waterline from the 12-foot waterline to the 34-foot water line and Bonjean Tables for each station at half-foot waterlines from 4-foot to 32-foot waterline. Compare the results you get from the computer program with those you obtained manually in Project #1.

2.2 Produce righting arm curves for USS OLYMPIA at 5 displacements: Design Displacement, Design Displacement (+) and (-) 10%, and Design Displacement (+) and (-) 20%. Discuss the results of the stability analysis, making reference to the previously performed hydrostatic analysis when needed. Specifically, address the change in GM with Displacement, and the effects upon stability.

<table>
<thead>
<tr>
<th>Design Displacement</th>
<th>6000 LT_{SW}</th>
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<tbody>
<tr>
<td>VCG</td>
<td>19' ABL</td>
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USS OLYMPIA Design Condition

3. Write-up
Treat your project write-up like a lab report. Provide an introduction and a narrative of what you actually did during the project. Ensure you address the italicized portions of this assignment. Provide a calculations section where you outline any computations you’ve made. Plots should be well referenced in your discussion.