AUTOPilot "BNAAC"

BNAAC IS THE NEW FUEL SAVE TYPE AUTOPilot INTRODUCED THE LATEST MODERN CONTROL THEORY.

Features

- Easy settlement of the Ship’s Basic Model
- Automatic update of the Ship’s Disturbance Model
- Improvement of Rudder Controllability by Detection of Disturbance
- Automatic setting of Rudder Control Gain Optimally
- “Improvement of Fuel Cost” as result of the above-mentioned features

BNAAC Block Diagram

- Red arrow shows normal autopilot control loop (Feedback Loop)
- Ship’s Basic Model
  This model estimates ship’s deviation based on the rudder input.
- Model Identifier (Disturbance Model)
  This model estimates disturbance around the ship.
- Current Ship’s Model
  This model is update Ship’s character and disturbance.
- Performance Index and Gain Computer
  This function calculates optimal rudder gain by current ship’s model.
◆ BNAAC has achieved course keeping equal with PT500A by an amount of the steer which is 60% less.
◆ ship’s speed was improved by BNAAC. As a result, fuel consumption was reduced compared with PT500A.
TEST RESULT OF FUEL CONSUMPTION

- Container Vessel (6,200TEU) and Cape Size Bulk Carrier (Example)

<table>
<thead>
<tr>
<th>Sea State</th>
<th>Average Container [%]</th>
<th>Average 180 BC [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.85</td>
<td>0.71</td>
</tr>
<tr>
<td>3</td>
<td>1.11</td>
<td>0.93</td>
</tr>
<tr>
<td>4</td>
<td>1.76</td>
<td>1.31</td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>0.52</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1.12</td>
<td>0.93</td>
</tr>
</tbody>
</table>

UPDATE PROCEDURE FROM PT500A

- Upgrading time will be only about 2 hours, and can be upgraded on berthing under cargo handling, without sea trial.
- PT500D AutoPilot also can be upgrade to BNAAC by exchanging Auto Steering Unit.

aa. Open Pilot Stand of PT500A. The Auto Steering Unit will be appeared.

bb. Remove the AUTO CPU and I/O(1) PCB for PT500A inside of the Auto Steering Unit.

cc. Exchange the AUTO CPU and I/O(1) PCB for BNAAC instead of the I/O(1) PCB for PT500A.

dd. Restore Pilot Stand.

e. BNAAC will work normally after setting parameters.