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Test Case TC53 Test current spd.dir w/ Leeway

Belongs to Plan(s): TP5 dashboard_tactics...

Belongs to Suite(s): TS18 NMEA simulator ...

Case Type: Functionality

Label(s): windows linux

Test Quality: EXCELLENT Defects Closed Fixed

Assign To: Petri Makijarvi

Case Priority: Medium

Estimate: 360

Is Automated

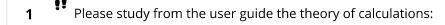
Precondition

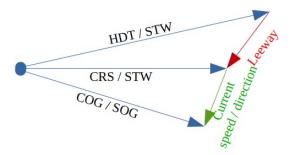
Pre-requisite for this test is successful execution of TC51. In this test we use NMEA simulator http://www.kave.fi /Apps/ to create and control speed on water, it is also to make the apparent wind consistent with the heel (in this, pro-forma). It will be used also to provide SOG and COG needed in calculations. The NMEA Simulator not sending XDR-sentences for heel, they are generated with NMEA Converter plugin.

Steps

Click "Tab" or "Shift + Tab" to navigate grid ?

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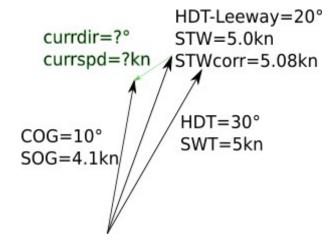
Please understand the limitations of the Leeway, being based not only to a physical measurement (e.g. erroneous paddlewheel) but also to a theoretical / experimental hull or leeway factor. In this test use case we consider those to be strictly correct, of course.

Please be reminded that in Tactics v1.0.009 the default is to correct the STW with Leeway. As consequence, the Leeway itself gets corrected, which is not clearly explained and can be confusing since the depicted STW value, if not corrected, is not actually the one used in the calculations. For the milestone v0.3.003 we have chosen to do so that the user selected STW correction operation applies both to Leeway calculation (TC51) and to the current calculation. Both options shall be tested. See also the Defect list for the corresponding GitHub issue report for more information.



Vector presentation of the static test arrangement to test the current calculation function:





The idea is to arrange with the NMEA simulator the conditions where the true heading is 30 degrees at 5 knots, while it provides course on ground 10 degrees at 4.1 knots. Similar to the Leeway correction test, we provide heel of 25 degrees on port side and hull factor of 10. This results to corrected course on water towards 20,3 degrees at corrected speed on water of 5.07 knots.

Our task is to calculate the estimated current, its direction and speed which leads, on top of the leeway to the course on ground.

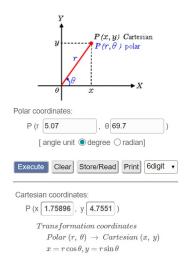


For the reference, the Cartesian coordinate based control calculation is provided here. Actually, an old fashioned calculator is used for convenience, but one can find easily such a calculator from on-line, like this Casio calculator: https://keisan.casio.com/calculator.

See also:

to Cartesian https://keisan.casio.com/exec/system/1223527679

and back to Polar: https://keisan.casio.com/exec/system/1223526375

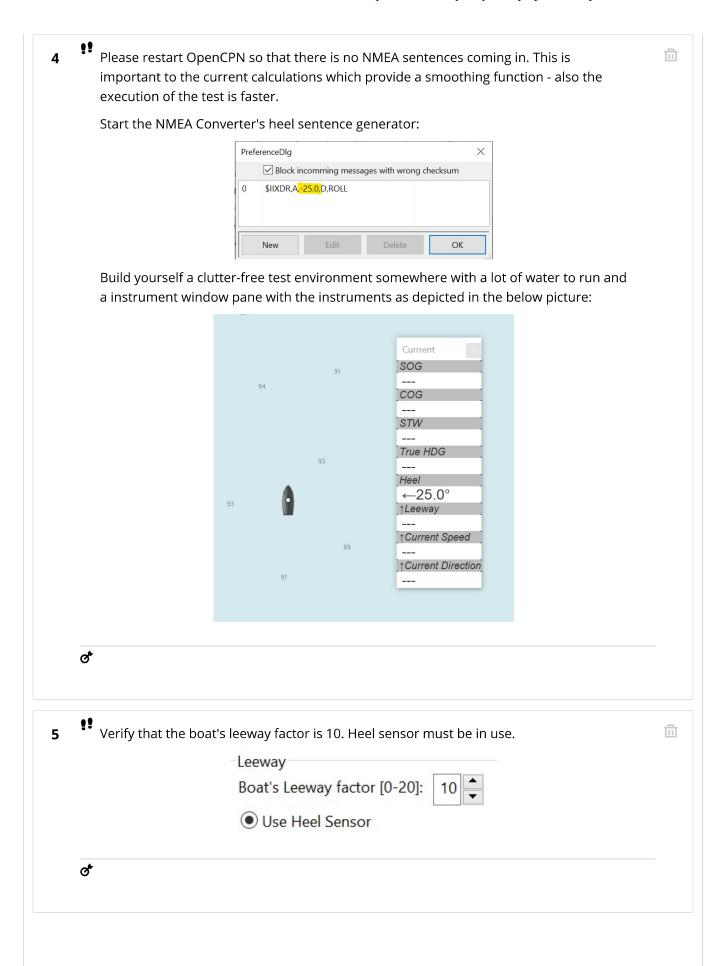


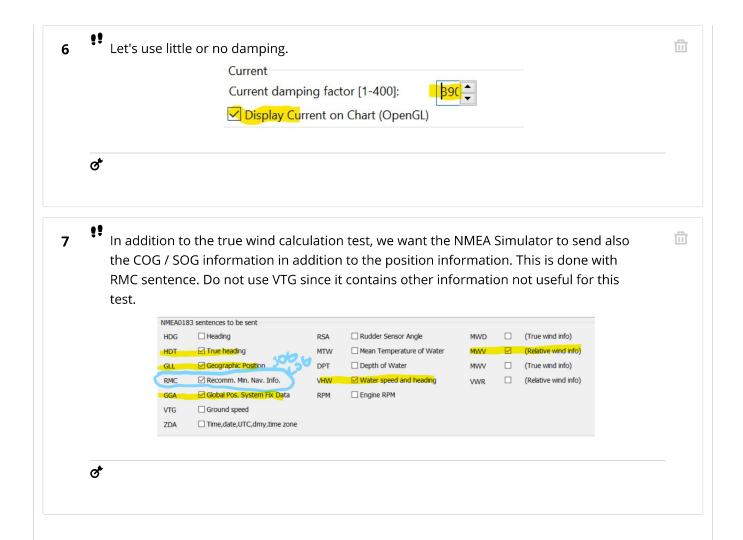
Polar $(r, \theta) \rightarrow Cartesian (x, y) \rightarrow Polar (r, \theta)$

| STW not corrected = 5.0 kn | STW corrected = 5.08 kn |
|---|---|
| P1 = P(5.0,70.0) = P1(1.7101,4.69846) | P1 = P(5.08,70.0) = P1(1.73746,4.77364 |
| P2 = P(4.1,80.0) = P(0.711958, 4.03771) | P2 = P(4.1,80.0) = P(0.711958, 4.03771) |
| Pcurr = P2 - P1 = P(-0.998142,-0.66075) | Pcurr = P2 - P1 = P(-1.025502,-0.73593) |
| Pcurr = P(1.19703,-146.496) | Pcurr = P(1.26224,-144.336) |
| Current speed = 1,20 knots Current direction = 236.5 degrees | Current speed = 1,27 knots Current direction = 234.3 degrees |

Note: your are not requested to recalculate these values if you do not like to do so. The calculated values are given as success criteria for the end of the test.

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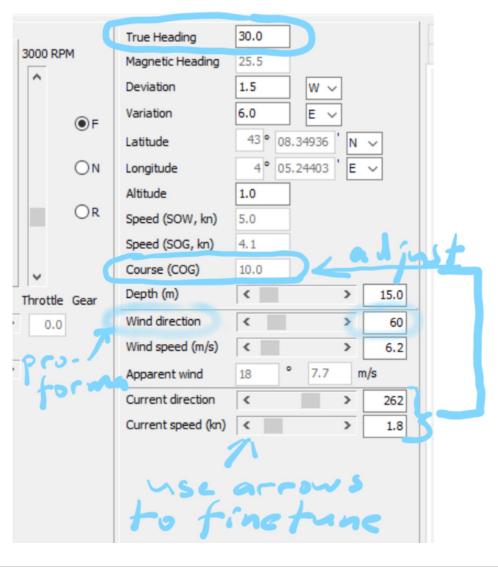


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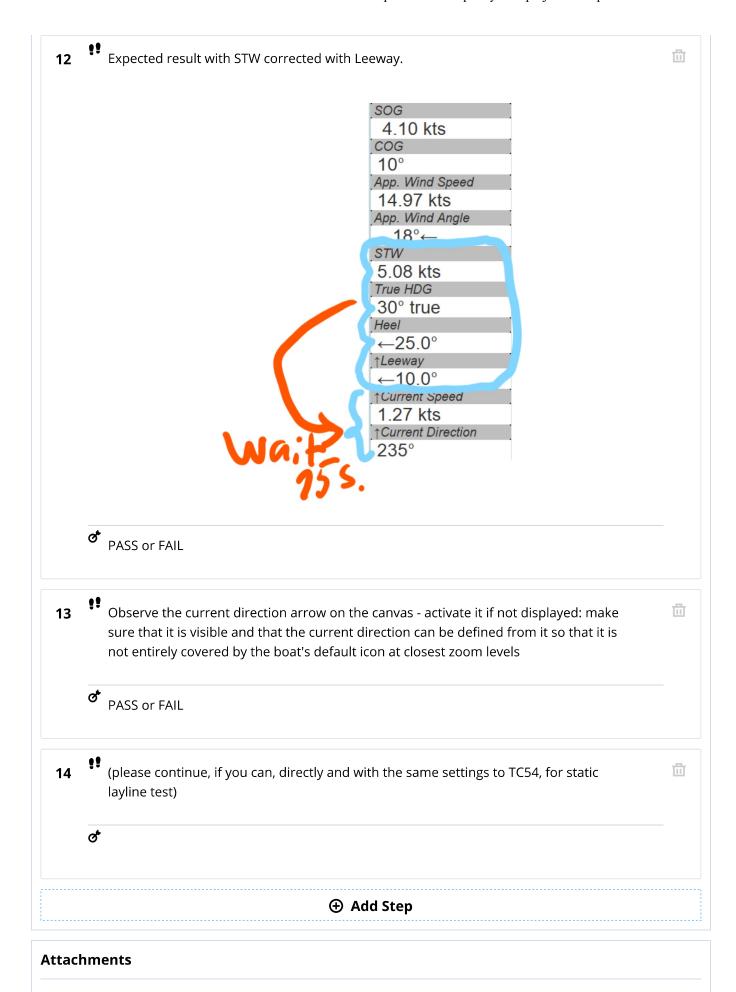
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Before launching a run, one needs to set the output COG value to 10.0 degrees and SOG value to 4.1 knots, starting from the earlier settings of SOW (STW) value of 5.0 knots. This is by adjusting NMEA Simulator's current direction and speed carefully by clicking the correspoding arrows, until the right amount of current from right direction makes the NMEA Simulator to set the SOG and COG, accordingly.

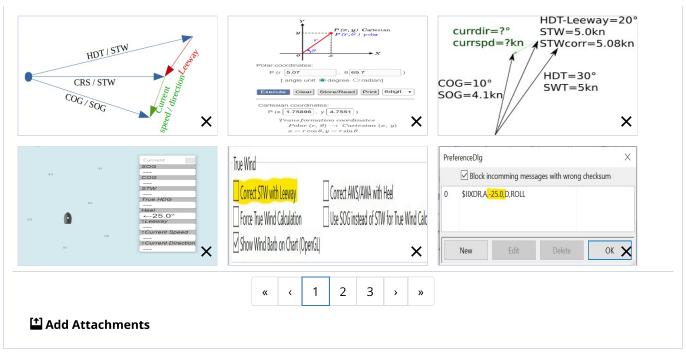
Note: NMEA Simulator's current direction and speed are NOT sent to the system under test (OpenCPN). They are used internally only, to set the SOG and COG. Anyway, this NMEA Simulator does not have the notion of Leeway, only current correction like for a motor boat so it should <u>not be used as reference in the current tests</u>.



| 9 | First test is to without STW correction with Leeway | | |
|----|--|---|--|
| | True Wind Correct STW with Leeway Force True Wind Calculation Use SOG instead of STW for True Wind Calc Show Wind Barb on Chart (OpenGL) | | |
| | ♂ | | |
| 10 | Set the NMEA Simulator to "Run" and move immediately to OpenCPN test view. Observe during a period of one minute for maximum that the current speed and direction stabilizes to expected values and that current arrow stabilizes, pointing to indicated direction. | ū | |
| | Expected result with no STW correction with Leeway | | |
| | SOG 4.10 kts COG 10° App. Wind Speed 14.97 kts App. Wind Angle 18° STW 5.00 kts True HDG 30° true Heel ←25.0° (Leeway ←10 0° 1Current Speed 1.21 kts 1Current Direction 237° | | |
| | PASS or FAIL | | |
| 11 | Second test is with STW correction with Leeway. | ū | |
| | | | |
| | True Wind Correct STW with Leeway Correct AWS/AWA with Heel Force True Wind Calculation Use SOG instead of STW for True Wind Calc Show Wind Barb on Chart (OpenGL) | | |



9/23/2020, 8:49 PM



| RESULTS | DEFECTS | REQUIREMENTS | | |
|------------------|-------------|--------------------------------------|------------------|---------|
| Status | Test Plan F | Run Assigned To | Updated At↑ | Actions |
| • Fail | TPR36 das | shboard_tactics_pi 🥞 Petri Makijarvi | about a year ago | 区 |
| ✓ Pass | TPR37 das | shboard_tactics_pi 🥞 Petri Makijarvi | about a year ago | 区 |
| ▶ Skip | TPR41 das | shboard_tactics_pi 🥞 Petri Makijarvi | about a year ago | 区 |
| ▶ Skip | TPR42 das | shboard_tactics_pi 🥞 Petri Makijarvi | about a year ago | 区 |
| 2 Pending | TPR43 das | shboard_tactics_pi 🥞 Petri Makijarvi | about a year ago | 区 |
| | | « (1 2 3 4) » | | |

ACTIVITY HISTORY COMMENTS