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Importance:
Subject: Correction to X craft Seakeeping Analysis for Ocean Hull Study
Sensitivity:
Date: Thu, 20 Jan 2005 14:43:49 -0500

All:

We have discovered an error in the input file used to develop the X craft seakeeping calculations for the last meeting. The erroneous term was roll gyradius which, as you might expect, has an effect on the roll motion of the vessel. We have redone the X craft seakeeping calculations with the correct input data and developed new speed polar plots.

With this correction, the X craft variant's performance is reduced because the roll limit is now encountered in beam seas.

I've attached a couple of powerpoint slides - the first is the existing affected slide from the 5 Jan presentation. The second is the corrected slide with the new X craft speed polar plots shown.

The sea state 6 plot is little changed in terms of operability because the X craft was already limited by lateral accelerations - the new areas of roll excess basically overlay the acceleration excesses, so there is little net change in operability.

In sea state 5, however, there is now a significant reduction in operability. Recall that, previously, all hull variants were fully operable in sea state 5. Now, with the revised calculations, the X craft has some significant areas of inoperability because of roll excess in beam seas (045 deg through 135 deg and 225 deg through 315 deg).

This roll excess in beam seas now shown on the X craft is in line with the roll excesses shown with the wide beam monohull variants - a product of a hull with very high transverse stability. As previously discussed, roll stabilization tanks won't work at these very short roll periods. An AGOR's slow speed and on-station operating profile also eliminates fin stabilizers as an option.

I don't have actual roll amplitudes at the moment, so I can't tell you by how much the X craft exceeds the limit. I can provide those at the next meeting.

By moving the X craft variant's hull closer together (i.e. keep the same box structure and simply move the underwater hulls closer to centerline), we can probably reduce the lateral accelerations somewhat, but not the roll excess.

Dan

OCEAN Class AGOR

Hull Selection Study

Old Slide - Previous Speed Polar Plots

Note: Shaded Areas Represent Speed and Heading Combinations Where SMR Motion Limits For Operability Are Exceeded

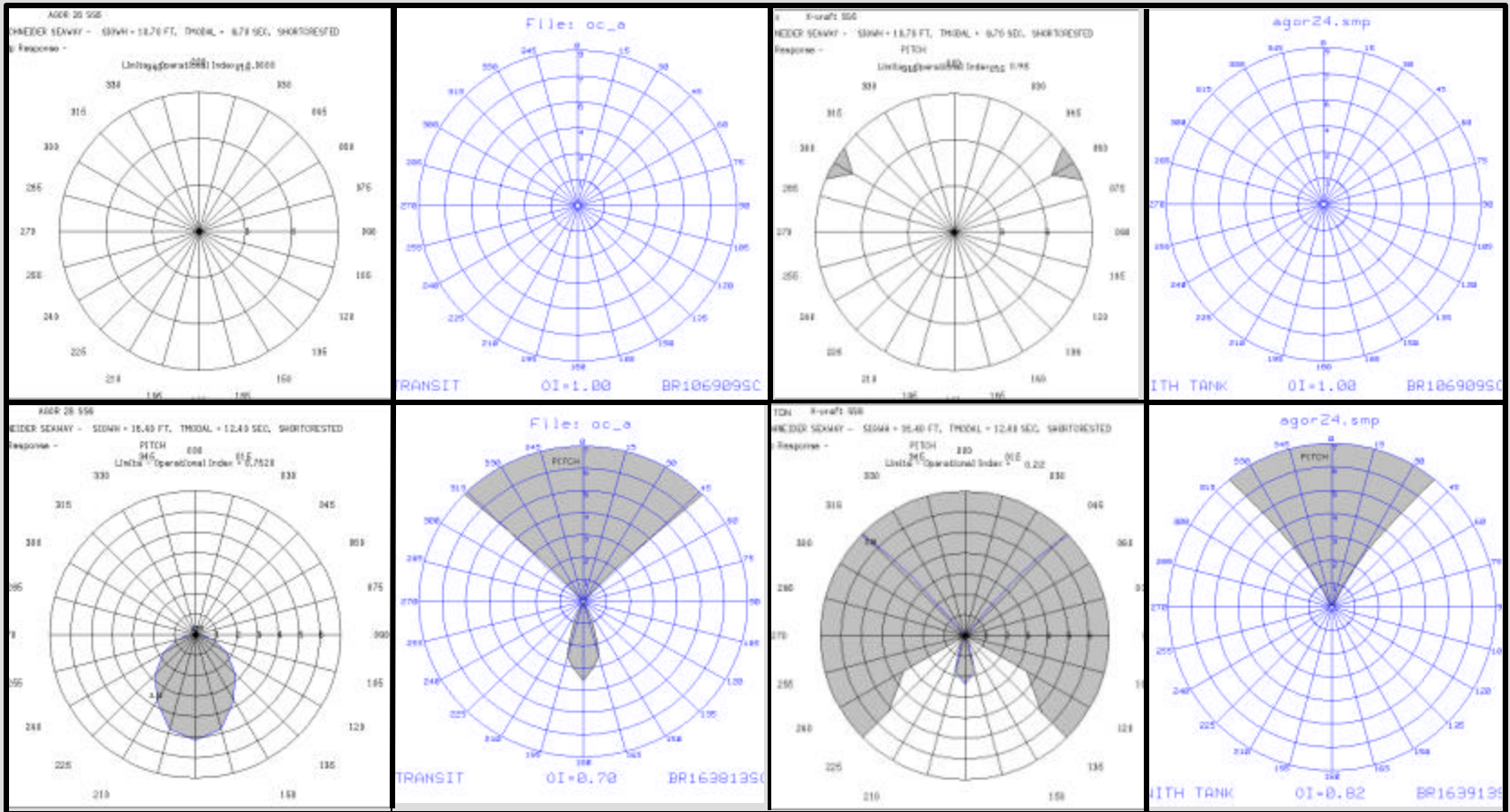
SWATH

Monohull
(Phase II short)

X-Craft
(2,400 ton)

R/V REVELLE
(AGOR 24)

Sea
State
Five



Sea
State
Six

Short Crested Seas

OCEAN Class AGOR

Hull Selection Study

New Slide - Revised X Craft Speed Polars

Note: Shaded Areas Represent Speed and Heading Combinations Where SMR Motion Limits For Operability Are Exceeded

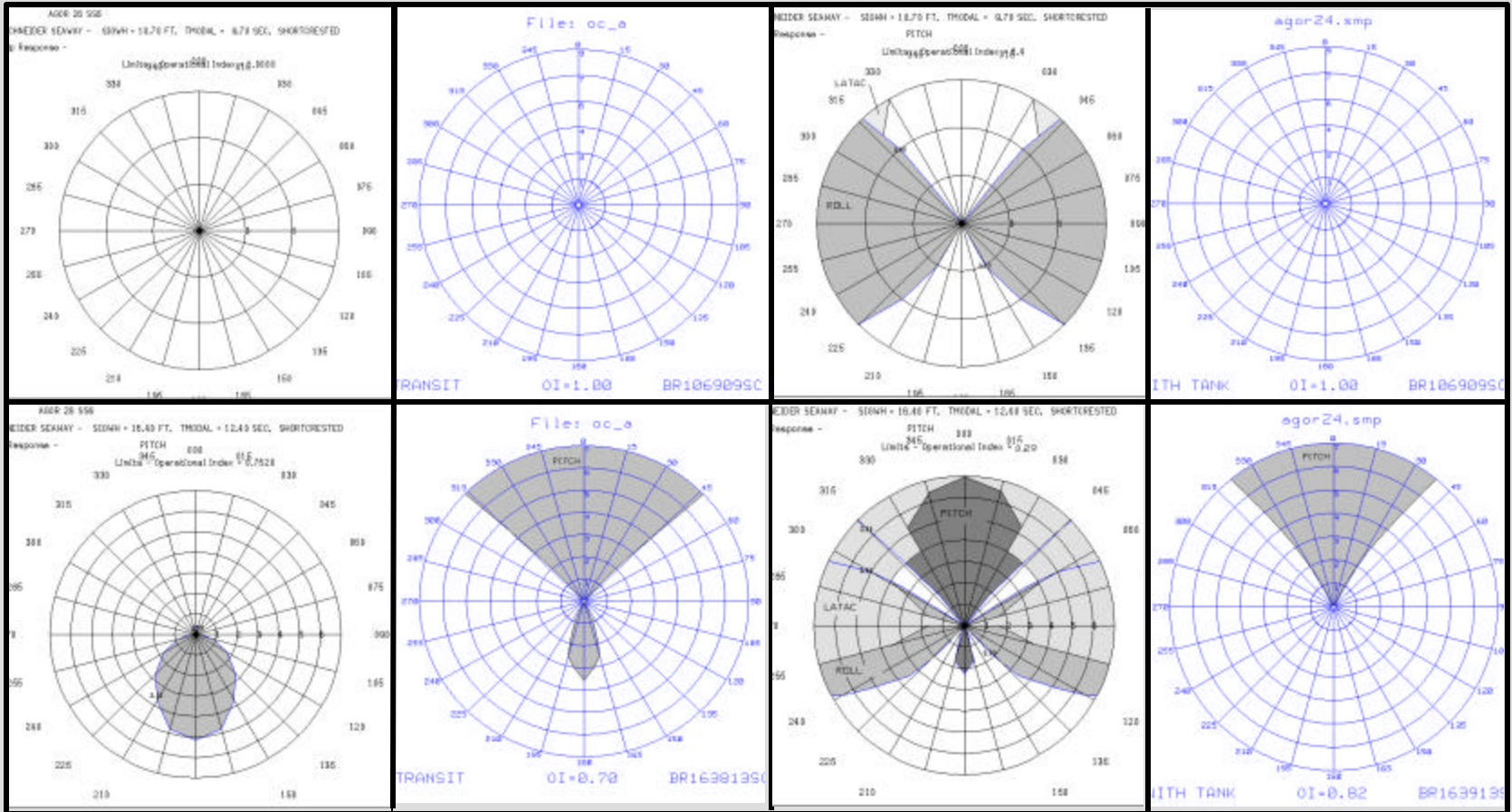
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