Pre-voyage planning software cuts costs

Knud E. Hansen (KEH) USA has been awarded a contract to deliver computational fluid dynamics (CFD) analysis for trim management onboard Princess Cruises' Grand class vessels. Sandra Speares reports.

As part of an ongoing co-operation with Onboard NAPA, the company has provided CFD analysis covering a large range of trim, draught and speed conditions using the Onboard Napa Loading Computer-Optifloat Module.

Optifloat is a tool developed by Onboard NAPA, which provides the vessel's crew with a recommended optimal floating position for voyage planning. Optifloat references the vessel's current floating position, which is retrieved from the loading computer, and compares it with a speed and power dataset of various speed, trim and draught conditions that is loaded into the software prior to installation onboard.

According to the company, Optifloat can be used in pre-voyage planning to maximise fuel savings by reducing required power through properly planned operations onboard. The software instructs the vessel's crew to change the vessels trim and draught to floating position which shows the most favourable resistance based on the desired speed for a given voyage.

The technology can be retrofitted to existing vessels, explains Douglas Frongillo, general manager at KEH. "All we need is the underwater hull geometry. Depending on what is available for input we can do as little or as much as they want". There are, however, minimum data requirements to get "full functionality", he says. The larger gaps there are between loading conditions, the less functional it will be, he adds.

So is the system designed to deal with specific conditions or itineraries? Frongillo says that it is possible to map out a matrix on the assumption of the vessel's speed – say 14 -22knots – and taking into account constraints on vessel strength. Given the right data input, the computer will read the

Sun Princess, one of three Grand class vessels that has been trialling the CFD software. Photo courtesy of Princess Cruises

current loading position and calculate whether by adjusting ballast or draught at a given speed it will be possible to make fuel savings.

The level of savings that can be achieved is difficult to assess, according to Frongillo. For every vessel type there are definitely savings to be made through trim optimisation, but they will vary according to the loading conditions as "there is only so much you can do." Severe draught or trim changes could adversely affect the performance of the vessel. The system is adaptable to every vessel type, but offers more potential for those operating at a much wider draught range.

In terms of cruise ships, systems like this are useful as time and money are important and any percentage saving on fuel, be it half a percent or two percent is welcome. As far as cruise

companies are concerned "depending on where they are operating for the season, their voyage plans tend to be very similar." They will, he says, have the same ballast conditions, the same places where they bunker and take on consumables. The system, he says allows cruise companies to backtrack and not be so committed to shoreside logistics but look at how they can optimise their marine operations.

"One thing that is nice about this kind of loading computer is that if you find you have a very optimal loading condition you can plan your entire voyage to maintain that position if you want by how you burn fuel and how you ballast". The system will recommend a certain trim and draught and will also indicate whether, in accordance with IMO regulations, the ship is allowed to operate in that condition. *NA*