

Cutting costs and carbon with vessel optimisation

Applied Weather Technology has released a new version of its BonVoyage System for vessel optimisation, with a range of additional functionality newly included in the software package. Skip Vaccarello and Rich Brown, AWT, explained the improvements to *Digital Ship*

Vessel optimisation company Applied Weather Technology (AWT) has released Version 6.0 of its BonVoyage System (BVS) software, introducing some additional new features designed to help ship captains and fleet managers reduce fuel costs and curb CO2 emissions by planning the most fuel-efficient routes given the latest weather and sea conditions.

AWT claims that many of the new innovations in BVS 6.0 are completely new for the shipping industry, such as high-resolution NCOM (Naval Coastal Ocean Model) data, 16-day forecasts which are updated four times daily, and the integration of 10-years of historical climate data for the planning of voyages longer than 16 days.

With this latest version of the software having been released at the end of October, Skip Vaccarello, president and CEO of AWT, believes that current market conditions, including changes in fuel prices and an increasing focus on the environmental impact of ship emissions, as well as the global economic downturn, have increased the potential demand for this type of optimisation system.

"Our number one concern is safety for ships and crews, so whenever we route a ship that's our paramount concern, but another driver of the business is clearly cost savings, and on time arrivals," he told us.

"As fuel prices get higher these become significant drivers of the business. Just as one example, a ship could use as much as \$500,000 of fuel to cross the Pacific, and we can demonstrate how we can save between 5 and 10 per cent of that fuel."

"That's \$25,000 to \$50,000, and it could be even more than that depending on the ship, for a service that typically costs \$1,000 or less. I've been involved in other technology businesses, but this is the first one where you can clearly demonstrate on a piece of paper the return on investment you could get."

An additional benefit of these cost savings from reduced fuel consumption is, of course, a reduction in consequent CO2 emissions, and with one ton of fuel creating three tons of carbon dioxide this can start to add up very quickly.

"The environmental savings, the CO2 savings go along with that," said Mr Vaccarello. "That's another element, the whole shipping industry is looking at emissions so that increases the value of the type of service we can provide."

"This can immediately provide CO2 emissions savings and in fact doesn't cost anything, you'll save money doing it, while proposals to do things like putting scrubbers on stacks are \$2 million or \$3 million solutions."

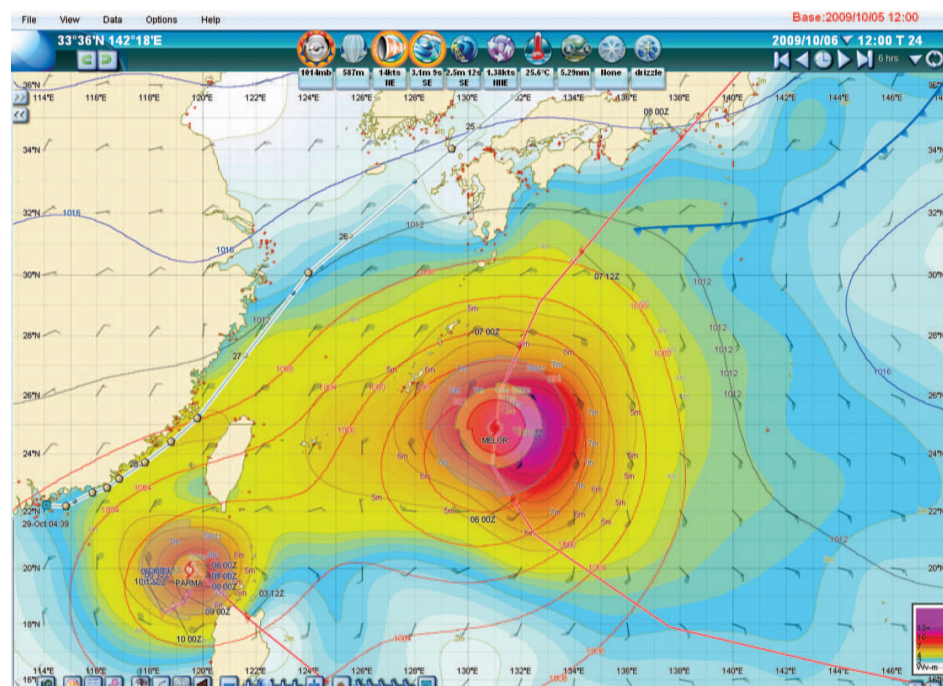
"When we've estimated some of the savings, as a company, if people around the world closely followed the reductions that we've seen, about 450,000 metric tonnes of fuel could be saved, which

would be 1.4 million tonnes of CO2 emissions, so it's pretty significant."

Enhanced data

One of the ways that AWT differentiates itself from other optimisation services is in the enhancement work that it performs on the data it receives from various sources.

Raw output data can be quite different to the enhanced information, with big differences in waves and winds and the inclement conditions that come with them,



explains Rich Brown, AWT vice president of product management.

"Most people are just taking raw data, repackaging it and sending it out to the ship," he said. "We're actually making changes to it."

"We do a pre-process before we run a wave model to match the winds and pressure with what the government agencies are saying. This can make a dramatic difference. When you're simulating and optimising and trying to pick a route it will have a big impact."

"We actually getting two different sources of data and putting them together, and we've automated all that. When we simulate a ship it's 'where is he, and what time is it?', and we can run the data."

One such data source is NCOM, the Naval Coastal Ocean Model produced by the US Navy, which provides daily analysis of currents with 72 hour forecasts and one-eighth degree resolution.

To improve on this further AWT combines the data from this model with other sources, like, for instance, tidal data, to try and get the most accurate picture possible of sea conditions.

This method also extends to the use of climatological ship resistance models, used to predict at-sea conditions over longer periods by averaging out differences in weather over time. Mr Brown notes that

the use of these averages can defeat the purpose of forecasting, to a great extent.

"Beyond the short range or medium range forecasts you use climatological weather, but when you average weather it ends up being very light," he told us. "If you're always down at the low end there's never much speed loss."

"What we did is take ten years' worth of historical weather data and ran billions of simulations, getting the speed losses based on headings, ship types and weather pat-

terns. This created a huge amount of data, which gives us a great tool for determining what the best recommendation should be."

"This is done for the whole world, for every day, for multiple ship types, containers, tankers, bulkers - there's about 15 different models we run just by ship type. We keep track of what's going on, what pattern we're in, and then project it out six months. Nobody else is doing anything like this, everyone else is using climatological weather, this is definitely a unique model we're using and it's giving us real good results."

terns. This created a huge amount of data, which gives us a great tool for determining what the best recommendation should be."

"This is done for the whole world, for every day, for multiple ship types, containers, tankers, bulkers - there's about 15 different models we run just by ship type. We keep track of what's going on, what pattern we're in, and then project it out six months. Nobody else is doing anything like this, everyone else is using climatological weather, this is definitely a unique model we're using and it's giving us real good results."

terns. This created a huge amount of data, which gives us a great tool for determining what the best recommendation should be."

"This is done for the whole world, for every day, for multiple ship types, containers, tankers, bulkers - there's about 15 different models we run just by ship type. We keep track of what's going on, what pattern we're in, and then project it out six months. Nobody else is doing anything like this, everyone else is using climatological weather, this is definitely a unique model we're using and it's giving us real good results."

terns. This created a huge amount of data, which gives us a great tool for determining what the best recommendation should be."

"This is done for the whole world, for every day, for multiple ship types, containers, tankers, bulkers - there's about 15 different models we run just by ship type. We keep track of what's going on, what pattern we're in, and then project it out six months. Nobody else is doing anything like this, everyone else is using climatological weather, this is definitely a unique model we're using and it's giving us real good results."

terns. This created a huge amount of data, which gives us a great tool for determining what the best recommendation should be."

"This is done for the whole world, for every day, for multiple ship types, containers, tankers, bulkers - there's about 15 different models we run just by ship type. We keep track of what's going on, what pattern we're in, and then project it out six months. Nobody else is doing anything like this, everyone else is using climatological weather, this is definitely a unique model we're using and it's giving us real good results."

terns. This created a huge amount of data, which gives us a great tool for determining what the best recommendation should be."

"This is done for the whole world, for every day, for multiple ship types, containers, tankers, bulkers - there's about 15 different models we run just by ship type. We keep track of what's going on, what pattern we're in, and then project it out six months. Nobody else is doing anything like this, everyone else is using climatological weather, this is definitely a unique model we're using and it's giving us real good results."

terns. This created a huge amount of data, which gives us a great tool for determining what the best recommendation should be."