Training, science, safety... and a funny hat

Delegates and exhibition visitors were able to see what happens when training meets science at a special exhibit in the foyer at *ITS*. K + S Projects of Berlin and Koblenz brought together scientists, a tug simulator, and a project devised especially for the convention, to study brain activity during very high workload situations associated with tug manoeuvres.

Tug captains including Arie Nygh, Ron Burchett and Jeff Slesinger took the controls of the simulator while wired up to an EEG, and delegates looked on at screens where bright colour maps, and a continuous brainwave graph, showed in real time the effects of pressure on concentration.

Jonas Broenstrup, who recently completed a masters in Human Factors at Berlin Institute of Technology, outlined the practical implications of their work for actual tug operations. He said: "An easy approach would be to put a light in the wheelhouse, which goes on whenever the captain dips into a very high workload. This could be used by the captain himself – he would know that if someone radios him with another task, weather status etc, he can put those things on hold until his high workload light goes out. Also, on bigger tugboats, when you have a large crew, if the light goes on and the cook, for example, enters the bridge with a question about dinner, he knows that now is not a good time for anything that is not immediately relevant.

◄ *Capt Arie Nygh takes the EEG simulator test.*

▲ *The K + S Projects stand at* ITS.

"More futuristically, perhaps, you could have three people sitting in a dark room in Hamburg, watching over all the tugboats operating in the harbour. Whenever someone has a really high workload, they just remotely switch into the system via two or three cameras on the tugboat, look at the situation, and say to the captain, 'look, we can see that you have a really high workload, let me worry about the winch for the next few minutes, you just keep the boat in the right place'.

"This is something that companies such as Volkswagen – who recently bought truck company Scania – and Airbus are already looking at, especially with regard to drowsiness detection. If you ask these people, they would never admit that they are tired, but on an EEG you can see they have microsleep times – pretty dangerous. And similarly, on the bridge, you have long periods of time where there's nothing to do, and we could give an alarm if concentration drops."

Prof Dr Klaus Gramann, Biological Psychology and Neuroergonomics at Berlin Institute of Technology, added: "Brain activity is just additional information. It's not as though now we have this information we can explain everything. It's not a solution, but it helps."

The stand also featured a 'mental typewriter' where delegates joined Prof Benjamin Blankertz, an expert on BCI (brain-computer interface), to learn how to spell out words using only their cortical activity.

The stand concept was put together by Kurt Scholz and Kerstin Klinkenberg. Scholz said: "It was our aim to open doors which might already be open in other contexts, like the aviation industry. We could feel a mixture of scepticism and open minds among the delegates, but I know my colleagues very well: the shipping business has its own speed, and a mixture of curiosity combined with calling things into question is a good way to find real conviction."

Naval architect Klinkenberg added: "We would be happy if our attempt to link the shipping world to the fundamentals of research work could bring a fresh breeze into the discussion on how to increase safety in our domain. The shipping business has very special demands. Aircraft pilots have to deal with higher speeds than us, but they are exposed to challenging environments only for hours. Sailors have to deal with rough seas, demanding situations, personal challenges for weeks – or even months.

"We would like to thank The ABR Company for their support with this project, in particular Garth Manson, Allan Brunton-Reed and Dawn Gorman. And we are very grateful towards our project partners – a good idea needs very strong partners – a very hearty thank you to them."